Service Manual
CU500

Model : CU500

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1. INTRODUCTION

1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of this model.

1.2 Regulatory Information

A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. System users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. The manufacturer does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it. The manufacturer will not be responsible for any charges that result from such unauthorized use.

B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the phones or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

D. Maintenance Limitations

Maintenance limitations on the phones must be performed only by the manufacturer or its authorized agent. The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

1. INTRODUCTION

E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

G. Interference and Attenuation

A phone may interfere with sensitive laboratory equipment, medical equipment, etc.
Interference from unsuppressed engines or electric motors may cause problems.

H. Electrostatic Sensitive Devices

ATTENTION

Boards, which contain Electrostatic Sensitive Device (ESD), are indicated by the sign.
Following information is ESD handling:

・Service personnel should ground themselves by using a wrist strap when exchange system boards.
・When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded.
・Use a suitable, grounded soldering iron.
・Keep sensitive parts in these protective packages until these are used.
・When returning system boards or parts like EEPROM to the factory, use the protective package as described.

2. PERFORMANCE

2. PERFORMANCE

2.1 System Overview

Item	Specification
Shape	GSM850/EGSM/1800/1900 and WCDMA Slim Clamshell
Size	96.5 X 49 X 19.1 mm
Weight	105 g (with Battery)
Power	3.7V normal, 1100 mAh Li-Polymer
Talk Time	Over 180 min (WCDMA, Voice) Over 180 min (GSM, Voice)
Stand by Time	Over 250 Hrs (WCDMA, DRX=1.28) Over 250 Hrs (GSM, Paging period=5)
Antenna	Intenna Type
LCD	TFT Main LCD(2', 262K, 176 x 220), TFT Sub LCD(65K, 96 x 96)
LCD Backlight	White LED Back Light
Camera	1.3 Mega pixel (CMOS)
Vibrator	Yes (Cylinder)
LED Indicator	No
C-MIC	Yes
Receiver	Yes
Earphone Jack	Yes(2.5mm)
Connectivity	Bluetooth, USB
Volume Key	Push Type(+, -)
External Memory	Micro_SD
I/O Connect	24 Pin

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2.2 Usable environment

1) Environment

Item	Specification
Voltage	4.0 V(Typ), 3.50 V(Min), [Shut Down : 3.35 V]
Operation Temp	-20 ~ +60 °C
Storage Temp	-30 ~ +85 °C
Humidity	85 % (Max)

2) Environment (Accessory)

Reference	Spec.	Min	Typ.	Max	Unit
TA Power	Available power	100	110	240	Vac

＊ CLA : 12 ~ 24 V(DC)

2.3 Radio Performance

1) Transmitter - GSM Mode

No	Item			GSM		DCS & PCS	
1	Conducted Spurious Emission	MS allocated Channel	100k~1GHz		-39dBm	9k ~ 1GHz	-39dBm
						1G~[A]MHz	-33dBm
			1G~12.75GHz		-33dBm	[A]M~[B]MHz	-39dBm
						[B]M~12.75GHz	-33dBm
		Idle Mode	100k~880MHz	-60dBm		100k~880MHz	-60dBm
			880M~915MHz	-62dBm		880M~915MHz	-62dBm
			915M~1GHz	-60dBm		915M~1GHz	-60dBm
			1G~[A]MHz	-50dBm		1G~[A]MHz	-50dBm
			[A]M~[B]MHz	-56dBm		[A]M~[B]MHz	-56dBm
			[B]M~12.5GHz	-50dBm		[B]M~12.5GHz	-50dBm

* In case of DCS : [A] -> 1710, [B] -> 1785   * In case of PCS : [A] -> 1850, [B] -> 1910

No	Item		GSM		DCS & PCS	
2	Radiated Spurious Emission	MS allocated Channel	30M ~ 1GHz	-36dBm	30M~1GHz	-36dBm
					1G~[A]MHz	-30dBm
			1G ~ 4GHz	-30dBm	[A]M~[B]MHz	-36dBm
					[B]M~4GHz	-30dBm
		Idle Mode	30M ~ 880MHz	-57dBm	30M~880MHz	-57dBm
			880M ~ 915MHz	-59dBm	880M~915MHz	-59dBm
			915M~1GHz	-57dBm	915M~1GHz	-57dBm
			1G~[A]MHz	-47dBm	1G~[A]MHz	-47dBm
			[A]M~[B]MHz	-53dBm	[A]M~[B]MHz	-53dBm
			[B]M~4GHz	-47dBm	[B]M~4GHz	-47dBm
3	Frequency Error		±0.1ppm		±0.1ppm	
4	Phase Error		±5(RMS)		±5(RMS)	
			±20(PEAK)		±20(PEAK)	
5	Frequency Error Under Multipath and Interference Condition		3dB below reference sensitivity		3dB below reference sensitivity	
			RA250 : ±200Hz		RA250: ±250Hz	
			HT100 : ±100Hz		HT100: ±250Hz	
			TU50 : ±100Hz		TU50: ±150Hz	
			TU3 : ±150Hz		TU1.5: ±200Hz	
6	Output RF Spectrum	Due to modulation	0 ~ 100kHz	+0.5dB	0 ~ 100kHz	+0.5dB
			200kHz	-30dB	200kHz	-30dB
			250kHz	-33dB	250kHz	-33dB
			400kHz	-60dB	400kHz	-60dB
			600 ~ 1800kHz	-66dB	600 ~ 1800kHz	-60dB
			1800 ~ 3000kHz	-69dB	1800 ~ 6000kHz	-65dB
			3000 ~ 6000kHz	-71dB	≥6000kHz	-73dB
			≥6000kHz	-77dB		
		Due to Switching transient	400kHz	-19dB	400kHz	-22dB
			600kHz	-21dB	600kHz	-24dB
			1200kHz	-21dB	1200kHz	-24dB
			1800kHz	-24dB	1800kHz	-27dB

* In case of DCS : [A] -> 1710, [B] -> 1785   * In case of PCS : [A] -> 1850, [B] -> 1910

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No	Item	GSM			DCS & PCS		
7	Intermodulation attenuation		–		Frequency offset		800kHz
					Intermodulation product should be Less than 55dB below the level of Wanted signal		
8	Transmitter Output Power	Power control	Power	Tolerance	Power control	Power	Tolerance
		Level	(dBm)	(dB)	Level	(dBm)	(dB)
		5	33	±3	0	30	±3
		6	31	±3	1	28	±3
		7	29	±3	2	26	±3
		8	27	±3	3	24	±3
		9	25	±3	4	22	±3
		10	23	±3	5	20	±3
		11	21	±3	6	18	±3
		12	19	±3	7	16	±3
		13	17	±3	8	14	±3
		14	15	±3	9	12	±4
		15	13	±3	10	10	±4
		16	11	±5	11	8	±4
		17	9	±5	12	6	±4
		18	7	±5	13	4	±4
		19	5	±5	14	2	±5
					15	0	±5
9	Burst timing	Mask IN			Mask IN		

2) Transmitter - WCDMA Mode

No	Item	Specification
1	Maximum Output Power	Class 3 : +24dBm(+1/-3dB)
2	Frequency Error	±0.1ppm
3	Open Loop Power control in uplink	±9dB@normal, ±12dB@extreme
4	Inner Loop Power control in uplink	Adjust output(TPC command) cmd 1dB 2dB 3dB +1 +0.5/1.5 +1/3 +1.5/4.5 0 -0.5/+0.5 -0.5/+0.5 -0.5/+0.5 -1 -0.5/-1.5 -1/-3 -1.5/-4.5 Group(10 equel command group) +1 +8/+12 +16/+24
5	Minimum Output Power	-50dBm(3.84MHz)
6	Out-of-synchronization handling of output power	Qin/Qout : PCCH quality levels Toff@DPCCH/Ior : -22 -> -28dB Ton@DPCCH/Ior : -24 -> -18dB
7	Transmit OFF Power	-56dBm(3.84MHz)
8	Transmit ON/OFF Time Mask	±25us PRACH,CPCH,uplinlk compressed mode
9	Change of TFC	±25us Power varies according to the data rate DTX : DPCH off (minimize interference between UE)
10	Power setting in uplink compressed	±3dB(after 14slots transmission gap)
11	Occupied Bandwidth(OBW)	5MHz(99%)
12	Spectrum emission Mask	-35-15*(Δf-2.5)dBc@Δf=2.5~3.5MHz,30k -35-1*(Δf-3.5)dBc@Δf=3.5~7.5MHz,1M -39-10*(Δf-7.5)dBc@Δf=7.5~8.5MHz,1M -49dBc@Δf=8.5~12.5MHz,1M

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No	Item	Specification
13	Adjacent Channel Leakage Ratio(ACLR)	33dB@5MHz, ACP>-50dBm 43dB@10MHz, ACP>-50dBm
14	Spurious Emissions (*: additional requirement)	-36dBm@f=9~150KHz, 1K BW -36dBm@f=50KHz~30MHz, 10K BW -36dBm@f=30MHz~1000MHz, 100K BW -30dBm@f=1~12.5GHz, 1M BW (*)-41dBm@f=1893.5~1919.6MHz, 300K (*)-67dBm@f=925~935MHz, 100K BW (*)-79dBm@f=935~960MHz, 100K BW (*)-71dBm@f=1805~1880MHz, 100K BW
15	Transmit Intermodulation	-31dBc@5MHz,Interferer -40dBc -41dBc@10MHz, Interferer -40dBc
16	Error Vector Magnitude (EVM)	17.5%(>-20dBm) (@12.2K, 1DPDCH+1DPCCH)
17	Transmit OFF Power	-15dB@SF=4.768Kbps, Multi-code transmission

3)Receiver - GSM Mode

No	Item		GSM	DCS & PCS
1	Sensitivity (TCH/FS Class II)		-105dBm	-105dBm
2	Co-Channel Rejection (TCH/FS Class II, RBER, TU high/FH)		C/Ic=7dB	Storage -30 ~ +85
3	Adjacent Channel Rejection	200kHz	C/Ia1=-12dB	C/Ia1=-12dB
		400kHz	C/Ia2=-44dB	C/Ia2=-44dB
4	Intermodulation Rejection		Wanted Signal :-98dBm 1st interferer:-44dBm 2nd interferer:-45dBm	Wanted Signal :-96dBm 1st interferer:-44dBm 2nd interferer:-44dBm
5	Blocking Response (TCH/FS Class II, RBER)		Wanted Signal :-101dBm Unwanted : Depend on Frequency	Wanted Signal :-101dBm Unwanted : Depend on Frequency

4) Receiver - WCDMA Mode

No	Item	Specification
1	Reference Sensitivity Level	-104.7 dBm(3.84 MHz)
2	Maximum Input Level	-25dBm(3.84MHz) -44dBm/3.84MHz(DPCH_Ec) UE@+20dBm output power(Class3)
3	Adjacent Channel Selectivity (ACS)	33dB UE@+20dBm output power(Class3)
4	In-band Blocking	-56dBm/3.84MHz@10MHz UE@+20dBm output power(Class3) -44dBm/3.84MHz@15MHz UE@+20dBm output power(Class3)
5	Out-band Blocking	-44dBm/3.84MHz@f=2050~2095 and 2185~2230MHz UE@+20dBm output power(Class3) -30dBm/3.84MHz@f=2025~2050 and 2230~2255MHz UE@+20dBm output power(Class3) -15dBm/3.84MHz@f=1~2025 and 2255~12500MHz UE@+20dBm output power(Class3)
6	Spurious Response	-44dBm CW UE@+20dBm output power(Class3)
7	Intermodulation Characteristic	-46dBm CW@10MHz -46dBm/3.84MHz@20MHz UE@+20dBm output power(Class3)
8	Spurious Emissions	-57dBm@f=9KHz~1GHz, 100K BW -47dBm@f=1~12.5GHz, 1M BW -60dBm@f=1920MHz~1980MHz, 3.84M BW -60dBm@f=2110MHz~2170MHz, 3.84M BW

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2.4 Current Consumption

	Stand by	Voice Call	VT
WCDMA	Under 4.4 mA (DRX=1.28)	Under 366 mA (Tx=12dBm)	
GSM	Under 4.4 mA (Paging=5period) Under 7.0 mA (@Bluetooth Connected, Paging=9period)	Under 366 mA (Tx=Max)	

(Stand by and Voice Call Test Condition : Bluetooth off, LCD backlight Off)
(VT Test Condition : Speaker off, LCD backlight On)

2.5 RSSI BAR

Level Change	WCDMA	GSM
BAR 5 → 4	-85 ± 2 dBm	-85 ± 2 dBm
BAR 4 → 3	-90 ± 2 dBm	-90 ± 2 dBm
BAR 3 → 2	-95 ± 2 dBm	-95 ± 2 dBm
BAR 2 → 1	-98 ± 2 dBm	-100 ± 2 dBm
BAR 1 → 0	-101 ± 2 dBm	-105 ± 2 dBm

2.6 Battery BAR

Indication	Standby
Bar 4	Over 3.9 ± 0.05V
Bar 4 → 3	3.9 ± 0.05V
Bar 3 → 2	3.77 ± 0.05V
Bar 2 → 1	3.7 ± 0.05V
Bar 1 → Empty	3.6 ± 0.05V
Low Voltage, Warning message+ Blinking	3.50 ± 0.05V (Stand-by) / 3.60 ± 0.05V (Talk) [Interval : 3min(Stand-by) / 1min(Talk)]
Power Off	3.35 ± 0.05V

2.7 Sound Pressure Level

No	Test Item		Specification	
1	Sending Loudness Rating (SLR)	MS	8 ±3 dB	
2	Receiving Loudness Rating (RLR)		Nor	-7 ± 3 dB
			Max	-18 ± 3 dB
3	Side Tone Masking Rating (STMR)		Min	17 dB
4	Echo Loss (EL)		Min	40 dB
5	Sending Distortion (SD)		Refer to Table 30.3	
6	Receiving Distortion (RD)		Refer to Table 30.4	
7	Idle Noise-Sending (INS)		Max	-64 dBm0p
8	Idle Noise-Receiving (INR)		Nor	Under -47 dBPA
			Max	Under -36 dBPA
9	Sending Loudness Rating (SLR)	Headset	8±3dB	
10	Receiving Loudness Rating (RLR)		Nor	-1 ±3 dB
			Max	-12 ±3 dB
11	Side Tone Masking Rating (STMR)		Min	25 dB
12	Echo Loss (EL)		Min	40 dB
13	Sending Distortion (SD)		Refer to Table 30.3	
14	Receiving Distortion (RD)		Refer to Table 30.4	
15	Idle Noise-Sending (INS)		Max	-55 dBm0p
16	Idle Noise-Receiving (INR)		Nor	Under -45 dBPA
			Max	Under -40 dBPA
17	TDMA Noise -. GSM : Power Level : 5 DCS/PCS : Power Level : 0 (Cell Power : -90 ~ -105 dBm) -. Acoustic (Max Vol.) MS/Headset SLR : 8 ± 3dB MS/Headset RLR : -18 ± 3dB/-15dB (SLR/RLR : Mid-value setting)	MS and Headset	Max	-62 dBm

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2.8 Charging

· **Charging Method :** CC & CV (Constant Current and Constant Voltage)

· **Maximum Charging Voltage :** 4.2 V

· **Maximum Charging Current :** 650 mA

· **Normal Battery Capacity :** 1100 mAh

· **Charging Time :** Max 3.0 hours (except for trickle charging time)

· **Full charging indication current (charging icon stop current) :** 80 mA

· **Cut-off voltage :** 3.35 V

3. TECHNICAL BRIEF

3.1 General Description

The CU500 supports UMTS-850, UMTS-1900, GSM-850, GSM-900, DCS-1800, and PCS-1900 based GSM/GPRS/EDGE/UMTS/HSDPA. All receivers and the UMTS transmitter use the radioOne[1]Zero-IF architecture to eliminate intermediate frequencies, directly converting signals between RF and baseband. The quad-band GSM transmitters use a baseband-to-IF upconversion followed by an offset phaselocked loop that translates the GMSK-modulated or 8-PSK-modulated signal to RF.
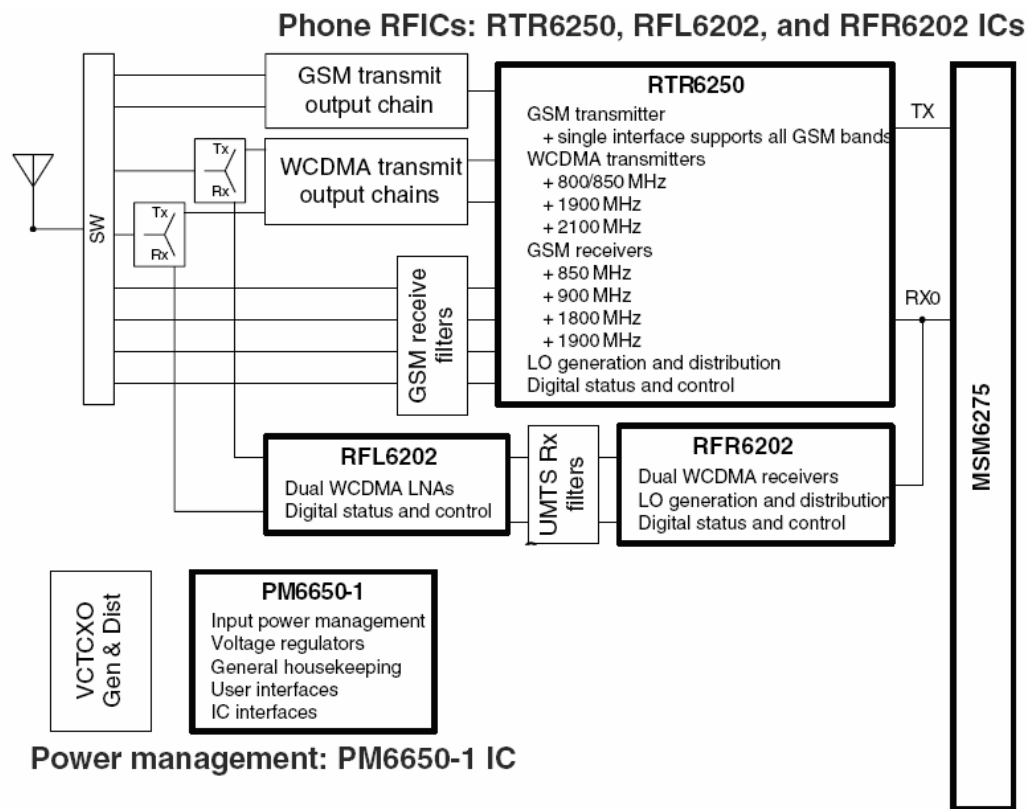

Fig 3.1 Block diagram of RF part

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[1] QUALCOMM's branded chipset that implements a Zero-IF radio architecture.

3. TECHNICAL BRIEF

A generic, high-level functional block diagram of CU500 is shown in Figure 3-1. One antenna collects base station forward link signals and radiates handset reverse link signals. The antenna connects with receive and transmit paths through a switch module (plus two duplexers for UMTS high-band and low-band operations).

The UMTS receive signal is amplified by the RFL6202 LNA then passes through a bandpass filter before being applied to the RFR6202 Receiver IC. On-chip circuits downconvert the received signal directly from RF to baseband using radioOne Zero-IF techniques. Generation of the UMTS downconverter LO is distributed between the RTR6250 (phase-locked loop), the RFR6202 (buffer amplifiers and LO distribution circuits) and external UHF VCO and loop filter circuits. The RFR6202 IC outputs analog baseband signals for further processing by the MSM device. This baseband interface is shared with the RTR6250 GSM850/GSM900/DCS/PCS receiver outputs.

GSM850, GSM-900, DCS and PCS receive signals pass through their bandpass filters then are applied to the RTR6250 IC. Similar to the UMTS path, RTR6250 circuits downconvert the received signals directly from RF to baseband. The GSM850/GSM900/DCS/PCS downconverter LO is generated mostly within the RTR6250 (PLL and distribution functions); the UMTS Rx CH VCO and loop filter are off-chip. The RTR analog baseband outputs are routed to the MSM6275 IC for further processing (an interface shared with the RFR).

The UMTS transmit path begins with analog baseband signals from the MSM device that drive the RTR6250 IC. Integrated PLL and VCO circuits generate the Tx LO used in the quadrature upconverter that translates baseband signals directly to RF. The RTR6250 output driver stages deliver fairly high-level signals that are filtered and applied to the power amplifiers (PA). The PA output is routed to the antenna through a duplexer and switch module.

The shared GSM-850, GSM900, DCS-1800, and PCS-1900 transmit path begins with the same baseband interface from the MSM6275 IC that is used for the UMTS band. A single GSM850/GSM900/DCS/PCS quadrature upconverter translates the GMSK or 8-PSK-modulated signal to a convenient intermediate frequency (IF) that forms one input to an offset phase-locked loop (OPLL). OPLL functions are split between the RTR6250 IC and off-chip loop filter and dual Tx VCO circuits, and translate the GMSK or 8-PSK-modulated signal to the desired GSM-850, GSM-900, DCS-1800 or PCS-1900 channel frequency. This signal is applied to a dual power amplifier (only one is active at a time). The enabled path continues with the PA, an automated power control (APC) circuit that samples the transmit power and adjusts its level, the switch module (which includes a band-appropriate lowpass filter), and the antenna.

CU500 power supply voltages are managed and regulated by the PM6650 Power Management IC. This versatile device integrates all wireless handset power management, general housekeeping, and user interface support functions into a single mixed signal IC. It monitors and controls the external power source and coordinates battery recharging while maintaining the handset supply voltages using low dropout, programmable regulators.

The device's general housekeeping functions include an ADC and analog multiplexer circuit for monitoring on-chip voltage sources, charging status, and current flow, as well as user-defined off-chip variables such as temperature, RF output power, and battery ID. Various oscillator, clock, and counter circuits support IC and higher-level handset functions. Key parameters such as under-voltage lockout and crystal oscillator signal presence are monitored to protect against detrimental conditions.

3.2 GSM Mode

3.2.1 GSM Receiver

The Dual-mode CU500's receiver functions are split between the three RFICs as follows:

- UMTS-850,1900 operation uses the RFL6202 LNA and RFR6202 Receiver ICs to implement the receive signal path, accepting an RF input and delivering analog baseband outputs (I and Q).
- GSM-850, GSM-900, DCS-1800, and PCS-1900 modes both use the RTR6250 IC only. Each mode has independent front-end circuits and down-converters, but they share common baseband circuits (with only one mode active at a time). All receiver control functions are beginning with SBI[2]-controlled parameters.

RF Front end consists of antenna, antenna switch module(CXG1198AEQ), and three RX saw filters(GSM850, GSM900, DCS and PCS). The antenna switch module allows multiple operating bands and modes to share the same antenna. In CU500, a common antenna connects to one of eight paths: 1) UMTS-850 Rx/Tx, 2) UMTS-1900 Rx/Tx, 3) GSM-850 Rx, 4) GSM-900 Rx, 5) GSM-850 GSM-900 Tx, (Low Band Tx's share the same path) 6) DCS-1800 Rx, and 7) DCS-1800,PCS-1900 Tx(High Band Tx's share the same path), 8) PCS-1900 Rx. UMTS operation requires simultaneous reception and transmission, so the UMTS Rx/Tx connection is routed to a duplexer that separates receive and transmit signals. GSM850/GSM900, DCS, and PCS operation is time division duplexed, so only the receiver or transmitter is active at any time and a frequency duplexer is not required.

	IN_A	IN_B	IN_C
GSM850/GSM900 TX	HIGH	HIGH	LOW
DCS/PCS TX	HIGH	LOW	LOW
GSM 850 RX	LOW	HIGH	LOW
UMTS 850	HIGH	LOW	HIGH
DCS RX	LOW	HIGH	HIGH
PCS RX	LOW	LOW	HIGH
UMTS 1900	HIGH	HIGH	HIGH
GSM 900	LOW	LOW	LOW

Table 3.2.1 Antenna Switch Module Control logic

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[2] The RFIC operating modes and circuit parameters are MSM-controlled through the proprietary 3-line Serial Bus Interface (SBI). The Application Programming Interface (API) is used to implement SBI commands. The API is documented in AMSS Software - please see applicable AMSS Software documentation for details.

3. TECHNICAL BRIEF

The GSM850, GSM900, DCS, and PCS receiver inputs of RTR6250 are connected directly to the transceiver front-end circuits(filters and antenna switch module). GSM850, GSM900, DCS, and PCS receiver inputs are similar to the RFR6202 UMTS Rx input in that they also use differential configurations to improve commonmode rejection and second-order non-linearity performance. The balance between the complementary signals is critical and must be maintained from the RF filter outputs all the way into the IC pins

Since GSM850, GSM900, DCS, and PCS signals are time-division duplex (the handset can only receive or transmit at one time), switches are used to separate Rx and Tx signals in place of frequency duplexers - this is accomplished in the switch module.

The GSM850, GSM900, DCS, and PCS receive signals are routed to the RTR6250 through band selection filters and matching networks that transform single-ended 50-Ω sources to differential impedances optimized for gain and noise figure. Similar to the RFR, the RTR input uses a differential configuration to improve second-order inter-modulation and common mode rejection performance. The RTR6250 input stages include MSM-controlled gain adjustments that maximize receiver dynamic range.

The amplifier outputs drive the RF ports of the quadrature RF-to-baseband downconverters. The downconverted baseband outputs are multiplexed and routed to lowpass filters (one I and one Q) having passband and stopband characteristics suitable for GMSK or 8-PSK processing. These filter circuits include DC offset corrections. The filter outputs are buffered and passed on to the MSM6275 IC for further processing (an interface shared with the RFR6202 UMTS receiver outputs).
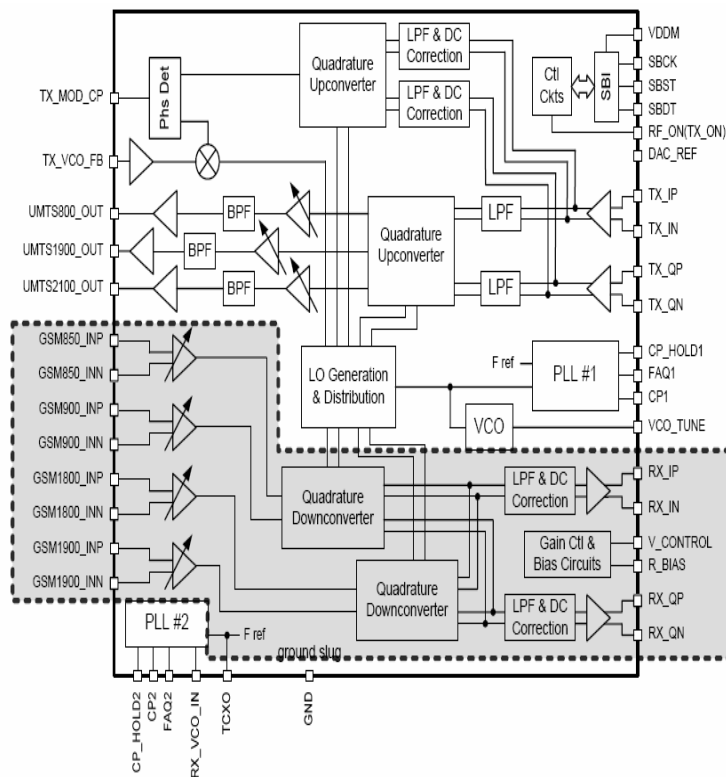
Figure 3.2.1 RTR6250 RX feature

3.2.2 GSM Transmitter

The shared GSM Low-band (GSM850/GSM900) and High-band (DCS1800, PCS1900) transmit path begins with the baseband inputs from the MSM6275 IC. These differential analog input signals are buffered, lowpass filtered, corrected for DC offsets then applied to the GSM quadrature upconverter. The upconverter LO signals are generated from the transceiver VCO signal by the LO distribution and generation circuits within RTR6250. This upconverter translates the GMSK or 8-PSK-modulated signal to a convenient intermediate frequency (IF) that forms one input to a frequency/phase detector circuit. This IF signal is the reference input to an offset phase-locked loop (OPLL) circuit as shown in Figure 3.2.2-1.
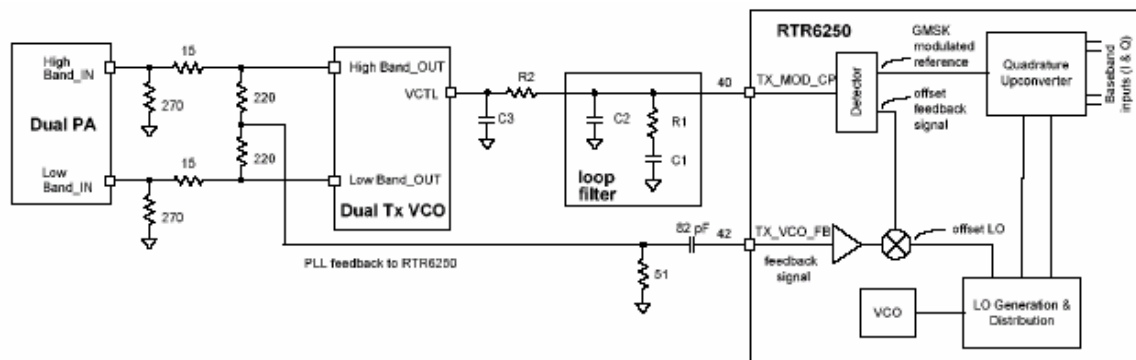
Figure 3.2.2-1 Offset phase-locked loop interfaces

The feedback path of this OPLL circuit includes a downconversion from the RF output frequency range to the IF range. The two inputs to this downconversion mixer are formed as follows:

1. The dual Tx VCO output (operating in the desired RF output frequency range) is buffered within the RTR6250 IC then applied to the mixer RF port.
2. The LO Generation and Distribution circuits that deliver the transmit path.s LO for the baseband-to-IF upconversion also provides the .offset LO. signal that is applied to the feedback path.s mixer LO port.

The mixer IF port output is the offset feedback signal - the variable input to the frequency/phase detector circuit. The detector compares its variable input to its reference input and generates an error signal that is lowpass filtered by the loop filter and applied to the dual Tx VCO tuning port to force the VCO output in the direction that minimizes errors. As mentioned earlier, the VCO output is connected to the feedback path thereby creating a closed-loop control system that will force frequency and phase errors between the variable and reference inputs to zero.

The waveform at the dual Tx VCO output is the GMSK or 8-PSK-modulated signal centered at the desired GSM channel frequency. A phase-locked loop circuit is used to translate the GMSK or 8-PSK-modulated signal from IF to RF primarily for two reasons:

1. Phase-locked loops provide a lowpass filter function from the reference input to the VCO output. This results in a bandpass function centered at the desired channel frequency that provides steep, well-controlled rejection of the out-of-band spectrum.
2. The resulting output bandpass function is virtually unchanged as the transmitter is tuned over channels spanning the GSM operating band.

The PA is a key component in any transmitter chain and must complement the rest of the transmitter precisely. For GSM band operation, the closed-loop transmit power control functions add even more requirements relative to the UMTS PA. In addition to gain control and switching requirements, the usual RF parameters such as gain, output power level, several output spectrum requirements, and power supply current are critical. The gain must be sufficient and variable to deliver the desired transmitter output power given the VCO output level, the subsequent passive devices' losses, and the control set point. The maximum and minimum transmitter output power levels depend upon the operating band class and mobile station class per the applicable standard. Transmitter timing requirements and inband and out-of-band emissions, all dominated by the PA, are also specified by the applicable standard.

The active dual Tx VCO output is applied to the dual power amplifier to continue the transmit path, and feedback to the RTR6250 IC to complete the frequency control loop. The PA operating band (GSM850/GSM900 or DCS/PCS) is selected by the MSM device GPIO control (GSM_PA_BAND).

3.3 UMTS Mode

3.3.1 Receiver

The UMTS duplexer receiver output is routed to LNA circuits within the RFL6202 device. These LNA functions are removed from the RFR6202 IC to improve mixer LO to RF isolation - a critical parameter in the Zero-IF architecture. Isolation is further improved using high reverse isolation circuits in the LNA designs. The LNA gain is controlled by the MSM device to minimize DC power consumption while achieving the desired RF performance.
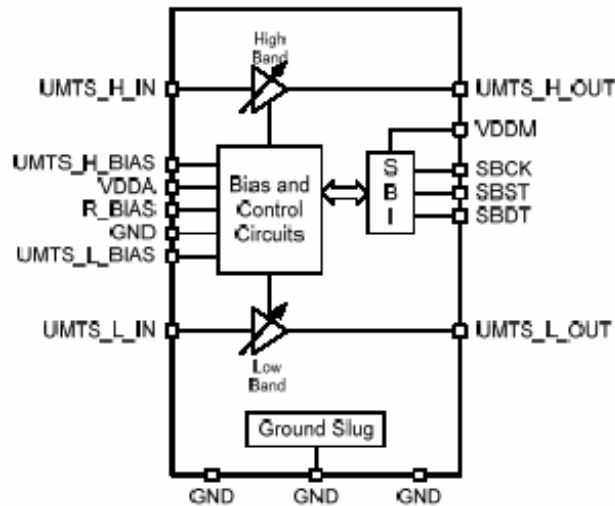
Figure 3.3.1-1 RFL6202 IC functional block diagram

The UMTS LNA output is routed to the RFR6202 through a band selection filter that transforms a single-ended 50Ω source to a differential impedance that is matched to the RFR6202 IC. The RFR input uses a differential configuration to improve second-order inter-modulation and common mode rejection performance. The RFR6202 input stages include MSM-controlled gain adjustments that further extend receiver dynamic range.

The RFR6202 IC (Figure 3.3.1-1) provides the UMTS Zero-IF receiver signal path, from RF to analog baseband. The input gain stage implements MSM controlled gain adjustments to extend receiver dynamic range. The amplifier output drives the RF port of the quadrature RF-to-baseband downconverter then the downconverted baseband outputs are routed to lowpass filters (one I and one Q) whose passband and stopband characteristics are suitable for DS-WCDMA signals. The filter outputs are buffered and routed to the MSM device for further processing. This baseband interface is shared with the RTR6250 GSM850/GSM900/DCS/PCS receiver outputs.

3. TECHNICAL BRIEF
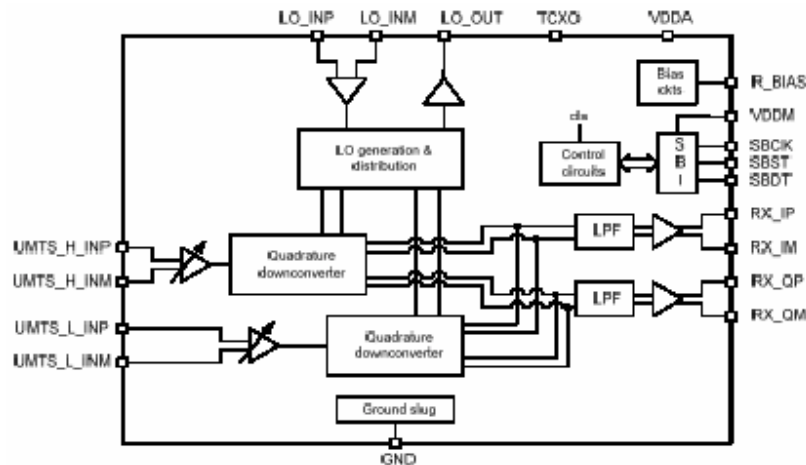
Figure 3.3.1-2 RFR6202 IC functional block diagram

The RFR6202 IC includes LO generation and distribution circuitry to reduce offchip component requirements. The UMTS Rx LO source is created using an external UMTS Rx CH VCO that is closed-loop controlled by the RTR6250 PLL2 via a discrete loop filter. The external UMTS_RX_VCO signal is processed by the LO generation and distribution circuits to create the quadrature downconverter LO signal. The LO signal applied at the mixer ports are at a frequency different than the VCO frequency. This assures that the VCO frequency is different than the RF frequency, an important consideration for Zero-IF processing. QUALCOMM.s Mobile Station Modem (MSM6275) device provides status and control signaling, employing power reduction features (such as selective circuit power-down, gain control, and bias control) to extend handset standby time.

3.3.2 Transmitter

The UMTS transmit path begins with analog baseband signals from the MSM device that drive the RTR6250 IC. The RTR6250 IC provides all the UMTS transmitter active signal-path circuits except the power amplifiers. Analog (I and Q) differential signals from the MSM device are buffered, filtered, and applied to Baseband-to-RF quadrature upconverters. Gain control is implemented on-chip.
The RF outputs include an integrated matching inductor, reducing the off-chip matching network to a single series capacitor.

The RTR6200 UMTS output is routed to its power amplifier through a bandpass filter, and delivers fairly high-level signals that are filtered and applied to the PA. The PA device used in CU500 is °∞Load Insensitive PA°±- no need to use isolator - and routed to the duplexer Tx port directly. Transmit power is delivered from the duplexer to the antenna through the switch module.

The RTR6250 IC integrates LO generation and distribution circuits on-chip, substantially reducing off-chip requirements. Various modes and programmable features result in a highly flexible transceiver LO output that supports not only UMTS transmissions, but all GSM850/900 and DCS1800/PCS1900 Rx and Tx modes as well.

The UMTS Tx LO (PLL1) is generated almost entirely on-chip, requiring only the loop filter off-chip (two capacitors and two resistors); all UMTS Tx VCO and PLL circuits are on-chip. An internal RTR6250 switch routes the internal VCO signal to the LO generation and distribution circuits to create the necessary UMTS Tx LO signals.

3.4 LO Phase-locked Loop

Most LO functions are fully integrated on-chip, do not require user adjustment, and need not be considered by handset designers. QUALCOMM has established and implemented frequency plans and LO generation schemes that support the radioOne 6250-IIseries chipset while requiring minimal off-chip design effort. Only one area requires handset designer attention: the loop filters of each phase-locked loop (PLL).

3.4.1 UMTS Rx PLL (PLL2)

UMTS Rx LO functional blocks are distributed between the RFR6202 IC, RTR6250 IC, and external UMTS_RX_CH_VCO and loop filter components (Figure 3.4.1-1). The external UMTS_RX_CH_VCO must be enabled for UMTS Rx operation and disabled otherwise; a dedicated MSM6275 IC signal (UHF_VCO_EN) enables the VCO.

Figure 3.4.1-1 UMTS Rx PLL functional block diagram

The RFR6202 IC accommodates single-ended or differential LO inputs; if singleended, either pin can be active. AC-couple the inactive pin to ground using an appropriately valued capacitor (12 pF is used in CU500). The 27 pF capacitor should be used to AC-couple the active pin to the VCO signal. Using only the selected VCO signal, the RFR6202 IC LO generation and distribution circuits create the necessary LO signals for the active quadrature downconverter.

A sample of the downconverter LO is buffered and routed from RFR6202 IC pin 19 to RTR6250 IC pin 32 (RX_VCO_IN). This signal requires a terminating resistor near the RTR6250 IC input pin and an AC coupling capacitor that assures the internal RTR6250 IC biasing is not disrupted in the example. Good microstrip or stripline controlled-impedance techniques must be used

Most UMTS Rx PLL circuits are included within the RTR6250 IC: reference divider, phase detector, charge pump, feedback divider, and digital logic that generate LOCK status. The buffered 19.2 MHz TCXO signal provides the synthesizer input (REF), the frequency reference to which the PLL is phase and frequency locked. The reference is divided by the R-Counter to create a fixed frequency input to the phase detector, FR. The other phase detector input (FV) varies as the loop acquires lock, and is generated by dividing the RX_VCO_IN frequency using the feedback path.s N-Counter. The closed loop will force FV to equal FR when locked. If the loop is not locked the error between FV and FR will create an error signal at the output of the charge pump. This error signal is filtered by the loop filter and applied to the VCO, tuning the output frequency such that the error is decreased. Ultimately the loop forces the error to approach zero and the PLL is phase and frequency locked.

Many key PLL performance characteristics are largely determined by the loop filter design - stability, transitory response, settling time, and phase noise.

3.4.2 Transceiver PLL (PLL1)

All LO functional blocks for the other handset modes(UMTS Tx, GSM850/GSM900 Tx/Rx, DCS Tx/Rx, PCS Tx/Rx) are integrated into the RTR6250 IC except the loop filter components (Figure 3.4.2-1). On-chip circuits include reference divider, phase detector, charge pump, VCO, feedback divider, and digital logic status. The functional description given in Section 3.4.1 for the UMTS Rx PLL applies to the Transceiver PLL as well.
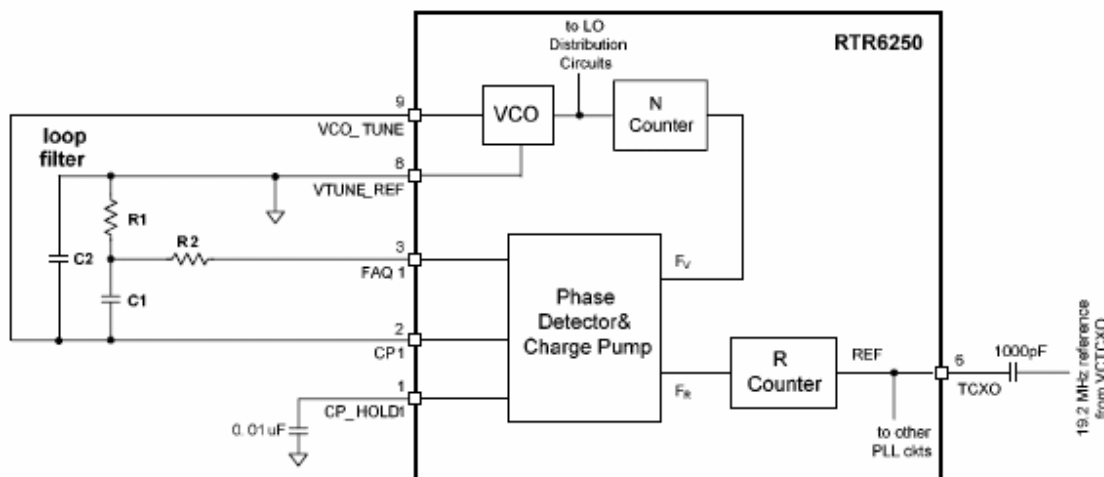
Figure 3.4.2-1 Transceiver PLL functional block diagram

The off-chip loop filter allows optimization of key PLL performance characteristics (stability, transitory response, settling time, and phase noise) for different applications. Guidelines are provided in the next subsection for proper implementation of this critical circuit.

3.5 Off-chip RF Components

3.5.1 Antenna switch module (U100 : CXG1198AEQ)

The antenna switch module allows multiple operating bands and modes to share the same antenna. In the CU500 design, a common antenna connects to one of eight paths: 1) UMTS-850 Rx/Tx, 2) UMTS-1900 Rx/Tx, 3) GSM-850 Rx, 4) GSM-900 Rx, 5) GSM-850/GSM-900 Tx(Low Band Tx's share the same path), 6) DCS-1800 Rx, and 7) DCS-1800,PCS-1900 Tx(High Band Tx's share the same path), 8) PCS-1900 Rx. UMTS operation requires simultaneous reception and transmission, so the UMTS Rx/Tx connection is routed to a duplexer that separates receive and transmit signals. GSM band of operation is time division duplexed, so only the receiver or transmitter is active at any time and a frequency duplexer is not required. The module includes lowpass filters for the GSM bands transmit paths to reduce out-of-band emissions, PA harmonics in particular.

3.5.2 UMTS duplexer (FL106_UMTS1900 : ACMD7402 , FL107_UMTS850 : B7637)

A UMTS duplexer splits a single operating band into receive and transmit paths. Important performance requirements include;

-. Insertion loss . this component is also in the receive and transmit paths ; In the CU500 typical losses : UMTS1900_ Tx = 2.1 dB, UMTS1900_ Rx = 2.8 dB and UMTS850_ Tx =1.9 dB, UMTS850_ Rx = 2.7 dB

-. Out-of-band rejection or attenuation . the duplexer provides input selectivity for the receiver, output filtering for the transmitter, and isolation between the two. Rejection levels for both paths are specified over a number of frequency ranges. Two Tx-to-Rx isolation levels are critical to receiver performance:

-. Rx-band isolation . the transmitter is specified for out-of-band noise falling into the Rx band. This noise leaks from the transmit path into the receive path, and must be limited to avoid degrading receiver sensitivity. The required Rx-band isolation depends on the PA out of-band noise levels and Rx-band losses between the PA and LNA. Minimum duplexer Rx band isolation value is about 45 dB.

-. Tx-band isolation . the transmit channel power also leaks into the receiver. In this case, the leakage is outside the receiver passband but at a relatively high level. It combines with Rx band jammers to create cross-modulation products that fall in-band to desensitize the receiver. The required Tx-band isolation depends on the PA channel power and Tx-band losses between the PA and LNA. Minimum duplexer Tx-band isolation value is about 55 dB.

-. Passband ripple . the loss of this fairly narrowband device is not flat across its passband. Passband ripple increases the receive or transmit insertion loss at specific frequencies, creating performance variations across the band.s channels, and should be controlled.

-. Return loss . minimize mismatch losses with typical return losses of 10 dB or more (VSWR <2:1).

-. Power handling . high power levels in the transmit path must be accommodated without degraded performance. The specified level depends on the operating band class and mobile station class (per the applicable standard), as well as circuit losses and antenna EIRP. Several duplexer characteristics depend upon its source and load impedances. QUALCOMM strongly recommends an isolator be used between the UMTS PA and duplexer to assure proper performance.

3.5.3 UMTS Power Amplifier (U105 : RF5144)

-. U105 : UMTS 850 Power Amplifier module

The RF5144 is a high-power, high-efficiency linear amplifier module specifically designed for 3V handheld systems. The device is manufactured on an advanced third generation GaAs HBT process, and was designed for use as the final RF amplifier in 3V UMTS handheld digital cellular equipment, spread-spectrum systems, and other applications in the 824MHz to 849MHz band and 1850MHz to 1910MHz band. The RF5144 has a digital control line for low power applications to lower quiescent current.

3.5.4 Thermistor (R1024 : 68K_2012_10%)

This thermistor senses temperature variations around UMTS PA to adjust PA gain deviation for assure compliance with the applicable transmit power control standards. Negative temperature compensation thermistor is used in the CU500.

3.5.5 UMTS transmit power detector (U107 : LMV232TLX)

This detector couples PA output power level to calibrate the transmitter characteristic over the channel variation and temperature. Its detector coupling range and converted voltage is based on diode sensitivity and transmitter power level.

The CU500 uses National Semiconductor LMV232TLX power detector IC. In Figure 3.5.5-1, RF input power range of the device has been optimized for use with a 20dB directional coupler, without the need for additional external componets. The device has two digital interfaces. A Shutdown function is available to set the device in a low-power shutdown mode. In case SD=High, the device is in shutdown, if SD=LOW the device is active.The Band-Select function controls the selection of the active RF input channel. In case BS=HIGH, Rfin1 is active. In case BS=LOW, Rfin2 is active.
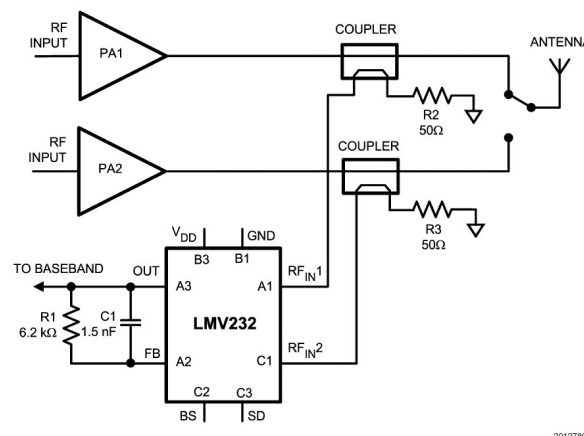
Figure 3.5.5-1 Block diagram of LMV232TLX with Coupler

3. TECHNICAL BRIEF

3.5.6 GSM/GPRS/EDGE Power amplifier (U102 : AND0041)

This power amplifier module is designed in a low profile (1.3 mm) and supports dual, tri and quad band applications for GMSK and 8-PSK modulation schemes using a polar architecture. There aretwo amplifier chains, one to support GSM850/900 bands, the other for DCS/PCS bands.

The module includes an internal reference voltage and integrated power control scheme for use in both GMSK and 8-PSK operation. This facilitates fast and easy production calibration and reduces the number of external components required to complete a power control function. The amplifier's power control range is typically 55 dB, with the output power set by applying an analog voltage to VRAMP.

All of the RF ports for this device are internally matched to 50Ω . Internal DC blocks are provided at the RF inputs.
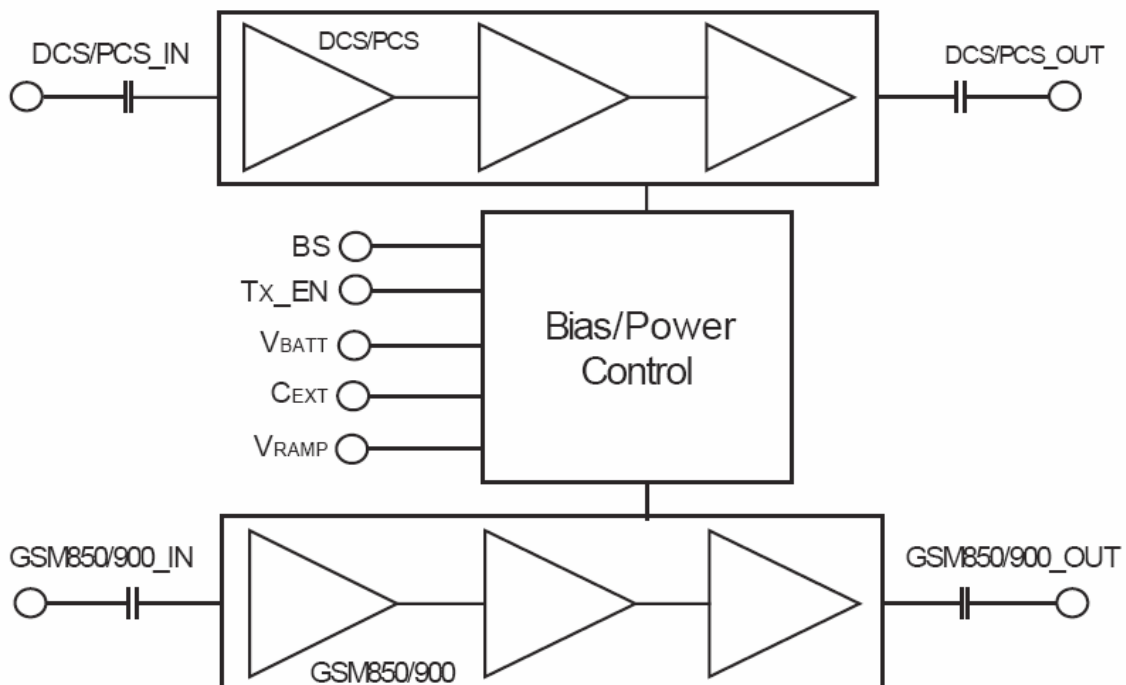
Figure 3.5.6-1 GSM PA functional block diagram

3.5.7 GSM transmit VCO (X101 : MQW5V0C869M)

The dual Tx VCO is a key component within the GSM OPLL. This VCO performance directly impacts PLL and transmitter performance. VCO specifications refer to muRata MQW5V0C869M datasheet.
The dual Tx VCO outputs, one for Low-band GSM and one for high band, drive a resistive network that splits the active signal into two signals: 1) the input to the active PA . this is the low loss path, and 2) the OPLL feedback signal . this is the high loss path.
The losses from the VCO outputs to the PA inputs must be factored into the output chain.s power budget. Each path includes a π-pad that introduces approximately a 3-dB loss. The low band GSM π-pad is formed by R1014 plus R1018, R1021, and R1022; the high band GSM π-pad is formed by R1016 plus R1019, R1020, and R1022. One leg of each π-pad is used to couple the VCO output to form the feedback path as described below.
For a given VCO output drive level, the loss to the RTR6250 input must assure the specified input level is achieved (-18 to -12 dBm). Large resistors included in the π-pads are used to lightly couple off the VCO outputs to create the feedback signal.
Since the RTR6250 TX_VCO_FB pin presents fairly high impedance, an external terminating resistor is required (R1022, 51 Ω). A series capacitor (82 pF) AC couples the feedback signal into the RTR6250 IC.

3.5.8 UMTS Rx RF filter (FL109, FL110)

FL109 - B7837	869 ~ 894MHz	GSM850 Rx RF filter
FL110 - B7847	1805 ~1880MHz	USPCS1800 Rx RF filter

An RF filter is located between the UMTS LNA and mixer. Insertion loss is important, but not as critical as losses before the LNA. The most important parameters of this component include:
• Out-of-band rejection or attenuation levels, usually specified to meet these conditions:

   - Far out-of-band signals - ranging from DC up to the first band of particular concern and from the last band of particular concern to beyond three times the highest passband frequency.
   - Tx-band leakage - the transmitter channel power, although attenuated by the duplexer, still presents a cross-modulation threat in combination with Rx-band jammers. The RF filter must provide rejection of this Tx-band leakage.
   - Other frequencies of particular concern . bands known to include other wireless transmitters that may deliver significant power levels to the receiver input.

• Phase and amplitude balance - the ZIF architecture requires well-balanced differential inputs to the RFR6202 IC. This is accomplished by the RF filter which takes a single-ended output from the RFL6202 IC and provides differential outputs having nominal 180°Δ phase separation. Phase and/or amplitude imbalance causes degraded common-mode rejection and second-order nonlinearity, so their requirements are specified jointly.

   - ±3 degrees and ± 1 dB
   - -12 to + 3 degrees and ± 0.7 dB

Of course, passband ripple and return loss are still important in all cases for the same reasons explained in the antenna switch module and duplexer sections.

3.5.9 GSM band Rx RF filter (FL100, FL101, FL102, FL103)

FL100 - B7845 869 ~ 894MHz GSM850 Rx RF filter
FL101 - B7851 1930 ~ 1990MHz PCS1900 Rx RF filter
FL102- B7837 880.2~959.8MHz GSM 900 Rx RF filter
FL103 - B7844 1805 ~1880MHz DCS1800 Rx RF filter

The GSM mode RF filters are located before their LNAs, so their insertion losses are extremely critical (1.5 dB typical). Other important parameters are:
· Out-of-band rejection or attenuation levels

- Far out-of-band signals - ranging from DC up to the first band of particular concern and from the last band of particular concern to beyond three times the highest passband frequency.
- Frequencies of particular concern . bands known to include other wireless transmitters that may deliver significant power levels to the receiver input.
- GSM band receivers operate while the handset transmitters are off so there are no Tx-band leakage attenuation requirements.

· Phase and amplitude balance - the UMTS discussion presented above applies for GSM bands as well. See the data sheet for specific values. Of course, passband ripple and return loss are still important in all cases for the same reasons explained in the antenna switch module and duplexer sections.

3.5.10 VCTCXO (X102 : TG-5001LA-19.2MHz)

The Voltage Controlled Temperature Compensated Crystal Oscillator (VCTCXO) provides the reference frequency for all RFIC synthesizers as well as clock generation functions within the MSM6275 IC. The 6250-series chipset requires a 19.2 MHz nominal VCTCXO frequency. The oscillator frequency is controlled by the MSM6275's TRK_LO_ADJ pulse density modulated signal in the same manner as the transmit gain control.

The filtered PDM signal results in an analog control signal into the VCTCXO tuning port whose voltage is directly proportional to the density of the digital bit stream. The MSM device varies the pulse density to change the analog control voltage that sets the oscillator frequency - all within a feedback control loop that minimizes handset frequency drift relative to the network.

3.5.11 UMTS Rx VCO (X100 : MQW541A1G44)

The UMTS dual-band Rx VCO is a key component in PLL2; VCO performance directly impacts Polar calibration accuracy and UMTS receiver performance. When the phone is not in the UMTS mode the unused VCO must be turned off by UHF_VCO_EN signal from MSM6275. Using only the external UMTS_RX_VCO signal, the LO generation and distribution circuits create the necessary LO signals for the quadrature down-converter.

3.5.12 Bluetooth (M1 : RB06A, ANT101 : ACS2450HBAM6)

The MSM6275 includes BT baseband embedded BT 1.1 compliant baseband core, so the other bluetooth components are an bluetooth RF module and Antenna. Figure3.5.12-1 shows the bluetooth system architecture in the CU500.
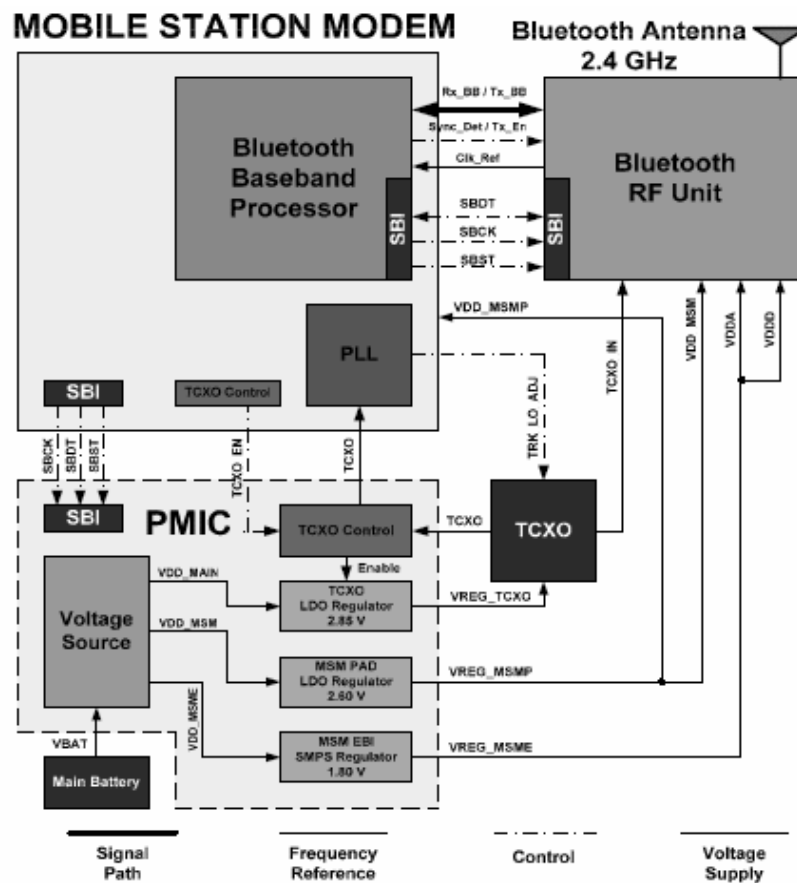
Figure3.5.12-1 Bluetooth system architecture

3. BB Technical Description

3.6 Digital Baseband(DBB/MSM6275)

3.6.1 General Description

A. Features(MSM6275)

· Support for multimode operation - WCDMA(UMTS),GSM/GPRS,EDGE
· The ARM926EJ-S microprocessor can operate at up to 225 MHz with variable rate, software controlled clocks to provide greater standby time.
· Supports low-power, low-frequency crystal to enable TCXO shutoff
· Integrated USIM Controller for direct interface to USIM card
· Software-controlled power management feature
· Integrated Bluetooth 1.2 baseband processor for wireless connectivity to peripherals
· Direct interface to digital camera module with video front end image processing
· Vocoder support (AMR,FR,EFR,HR)
· Advanced 409-ball CSP packaging
· WCDMA Features
  - supports release 99 June 2004 of the W-CDMA FDD standard
  - PS data rates supporting 384kbps DL / 384kbps UL
  - CS data rates supporting 64kbps DL / 64kbps UL
  - AMR (all rates)
· GSM Features
  - Voice features (FR,EFR,AMR,HR)
  - Circuit-switched data features(9.6K,14.4K,Fax)
· GPRS Features
  - Class B operation
  - Multi-slot class 10 data services
  - CS schemes CS1,CS2,CS3,CS4
· EDGE Features
  - EDGE E2 power class for 8PSK
  - Class B, multi-slot class 10
  - Downlink/Uplink coding schemes (CS1-4, MCS1-9)
· Operation and Services
  - LCD & Camera Interface
  - USIM Interface
  - Dual Memory Buses(EBI1-SDRAM & EBI2-NAND Flash)
  - External Memory Interface (T-Flash)
  - RTC
· Data Communication
  - UART (Universal asynchronous receiver transmitter)
  - Slave USB

3.7 Hardware Architecture
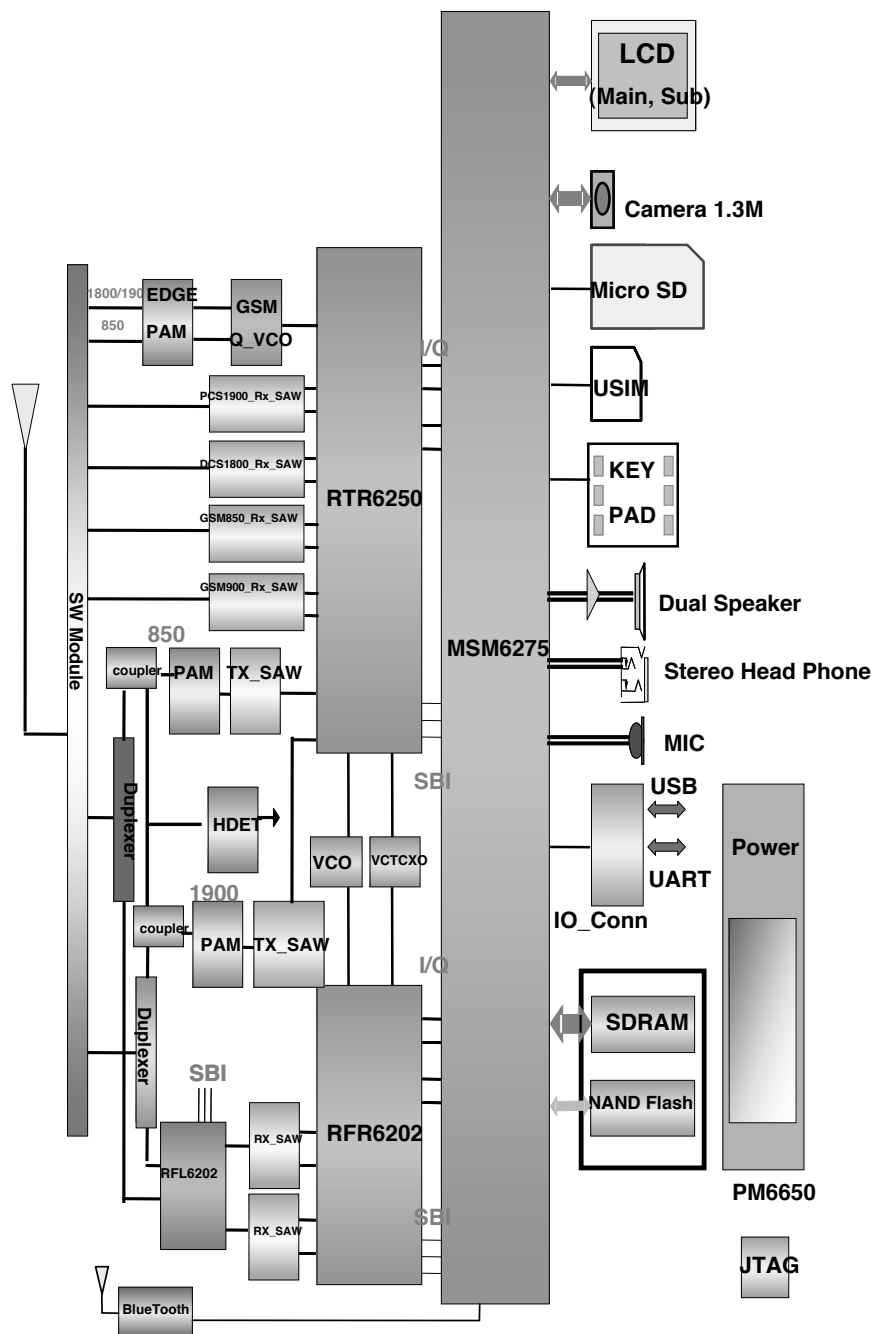
Figure. Simplified Block Diagram

3.7.1 Block Diagram(MSM6275)
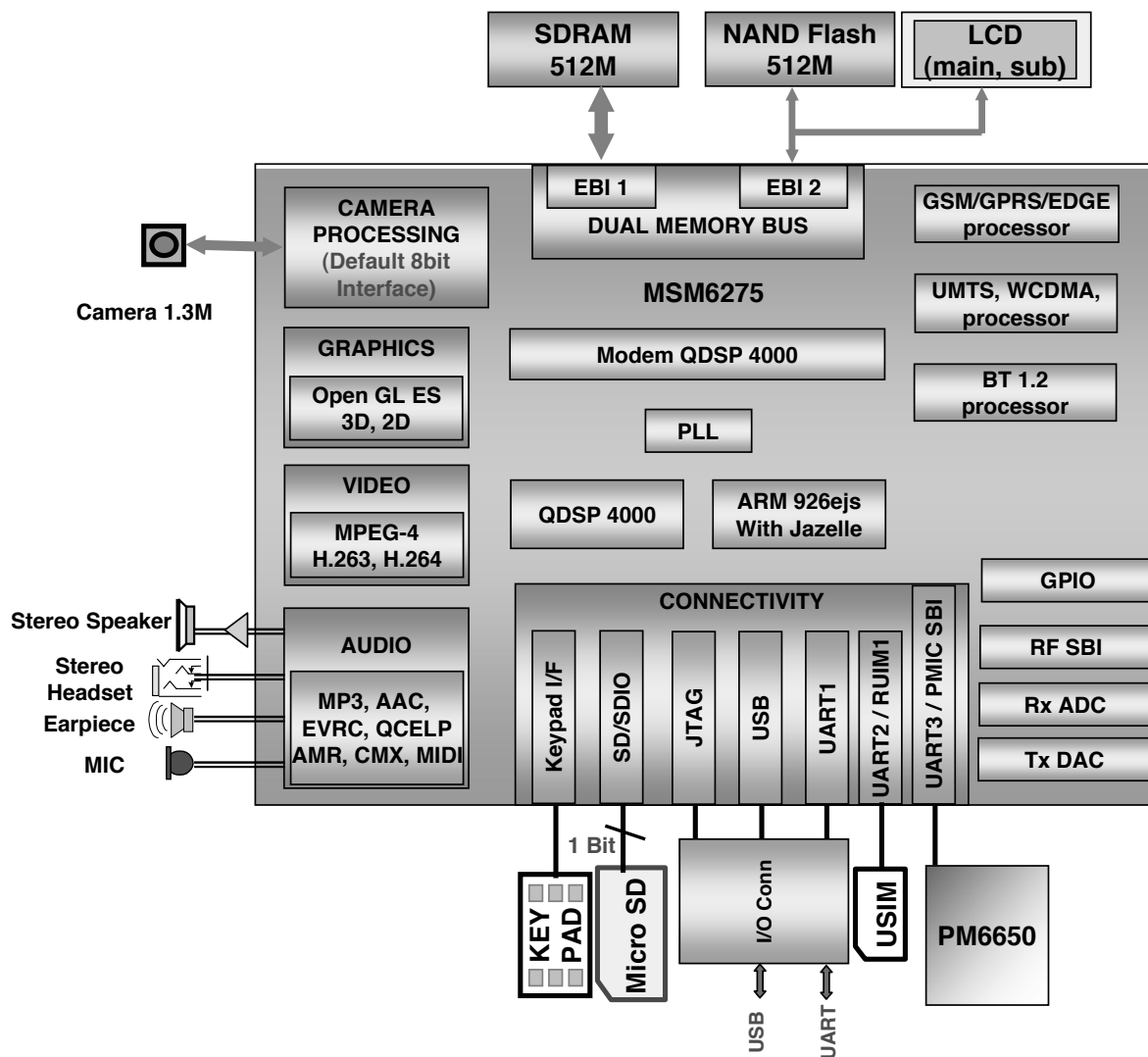
Figure. Simplified Block Diagram of MSM6275

3.8 Subsystem(MSM6275)

3.8.1 ARM Microprocessor Subsystem

The MSM6275 device uses an embedded ARM926EJ-S microprocessor. This microprocessor, through the system software, controls most of the functionality for the MSM, including control of the external peripherals such as the keypad, LCD, SDRAM, and NAND-Flash devices. Through a QUALCOMM proprietary serial bus interface (SBI) the ARM926EJ-S configures and controls the functionality of the RTR6250, RFR6202, RFL6202, and PM6650 devices.

3.8.2 UMTS Subsystem

The UMTS Subsystem performs the digital UMTS signal processing. Its components include:
· Searcher engine
· Demodulating fingers
· Combining block
· Frame deinterleaver
· Viterbi decoder
· Up-link subsystem
· Turbo decoder
On the down-link channel the UMTS subsystem searches, demodulates, and decodes incoming CPICH, CCPCH, SCH, and Traffic Channel information. It extracts packet data from the downlink traffic channel and prepares the packet data for processing. For the up-link, the WCDMA subsystem processes the packet data and modulates the up-link traffic channel (DCH).

3.8.3 GSM Subsystem

The GSM/GPRS/EGPRS subsystem reuses the MSM6250 GSM core. It performs the digital GSM signal processing and PA gain controls for GPRS support. The PA output level is controlled by an analog signal generated on the MSM. In GSM mode, the power profile ramps up before the burst and ramps down after the burst. In GPRS mode, at the beginning of each burst (up to four active transmit slots), PA must be smoothly ramped up to some desired output power level, held at that level for the current slot, smoothly ramped down/up during the transition period and held to the new level for the next slot until the last slot. Then it must be smoothly ramped down to near-zero level. The MSM6275 support differential GSM PA power control output. The RF interface communicates with the mobile station external RF circuits. Signals to these circuits control signal gain in the Rx and Tx signal path, control DC offset errors, and maintain the system frequency reference.

3.8.4 RF Interface

The RF interface communicates with the mobile station's external RF and analog baseband circuits. Signals to these circuits control signal gain in the Rx and Tx signal path and maintain The system's frequency reference.

3.8.5 Serial Bus Interface(SBI)

The MSM6275 device's SBI is designed specifically to be a quick, low pin count control protocol for QUALCOMM's RTR6250, RFR6202, RFL6202, and PM6650 ASICs. Using the SBI, the RTR6250, RFR6202, RFL6202, and PM6650 devices can be configured for different operating modes and for minimum power consumption, extending battery life in Standby mode. The SBI also controls DC baseband offset errors.

3.8.6 Wideband CODEC

The MSM6275 device integrates a wideband voice/audio CODEC into the mobile station modem (MSM). The CODEC supports two differential microphone inputs, one differential earphone output, one single-ended earphone output, and a differential analog auxiliary interface. The CODEC integrates the microphone and earphone amplifiers into the MSM6250 device, reducing the external component count to just a few passive components. The microphone (Tx) audio path consists of a two-stage amplifier with the gain of the second stage set externally. The Rx/Tx paths are designed to meet the ITU-G.712 requirements for digital transmission systems.

3.8.7 Vocoder Subsystem

The MSM6275 device's QDSP4000 supports AMR,FR,EFR and HR. In addition, the QDSP4000 has modules to support the following audio functions: DTMF tone generation, DTMF tone detection, Tx/Rx volume controls, Tx/Rx automatic gain control (AGC), Rx Automatic Volume Control (AVC), EarSeal Echo Canceller (ESEC), Acoustic Echo Canceller (AEC), Noise Suppression (NS), and programmable, 13-tap, Type-I, FIR, Tx/Rx compensation filters. The MSM6275 device's integrated ARM9TDMI processor downloads the firmware into the QDSP4000 and configures QDSP4000 to support the desired functionality.

3.8.8 ARM Microprocessor subsystem

The MSM6275 device uses an embedded ARM926EJ-S microprocessor. This microprocessor, through the system software, controls most of the functionality for the MSM device, including control of the external peripherals such as the keypad, LCD, RAM, ROM, and EEPROM devices. Through a generic serial bus interface (SBI) the ARM926EJ-S configures and controls the functionality of the RFL6202, RFR6202, RTR6250, RTR6200, and PM6650 devices.

3.8.9 Mode Select and JTAG Interfaces

The mode pins to the MSM6275 device determine the overall operating mode of the ASIC. The options under the control of the mode inputs are Native mode, which is the normal subscriber unit operation, ETM mode, which enables the built-in trace mode, and test mode for factory testing. The MSM6275 device meets the intent of the ANSI/IEEE 1149.1A-1993 feature list. The JTAG interface can be used to test digital interconnects between devices within the mobile station during manufacture.

3. TECHNICAL BRIEF

3.8.10 General-Purpose Input/Output Interface

The MSM6275 device has general-purpose bidirectional input/output pins. Some of the GPIO pins have alternate functions supported on them. The alternate functions include USB interface, additional RAM, ROM, general-purpose chip selects, parallel LCD interface, and a UART interface. The function of these pins is documented in the various software releases.

3.8.11 UART

The MSM6275 device employs three UARTs. UART1 has dedicated pins while UART2 and UART3 share multiplexed pins.
・UART1 for data
・UART2 (can be used for USIM interface)
・UART3 (can be used for PM SBI interface)

3.8.11 USB

The MSM6275 device integrates a universal serial bus (USB) controller that supports both unidirectional and bidirectional transceiver interfaces. The USB controller acts as a USB peripheral communicating with the USB host.

3.9 Power Block

3.9.1 General

MSM6275, included RF, is fully covered by PM6650(Qualcomm PMIC). PM6650 cover the power of MSM6275, MSM memory, RF block, Bluetooth, Micro SD, USIM and TCXO. Major power components are :

PM6650(U400) : Phone power supply
MIC5252-2.8BML(U500) : LCD Power
AAT31521WP(U501) : LCD Backlight charge pump
MIC2211_LGYML (U503) : Camera power

3.9.2 PM6650

The PM6650 device (Figure 3-1) integrates all wireless handset power management. The power management portion accepts power from all the most common sources - battery, external charger, adapter, coin cell back-up - and generates all the regulated voltages needed to power the appropriate handset electronics. It monitors and controls the power sources, detecting which sources are applied, verifying that they are within acceptable operational limits, and coordinates battery and coin cell recharging while maintaining the handset electronics supply voltages. Eight programmable output voltages are generated using low dropout voltage regulators, all derived from a common trimmed voltage reference. A dedicated controller manages the TCXO warm-up and signal buffering, and key parameters (under-voltage lockout and crystal oscillator signal presence) are monitored to protect against detrimental conditions.
MSM device controls and statuses the PM6650 IC using a three-line Serial Bus Interface (SBI) supplemented by an Interrupt Manager for time-critical information. Another dedicated IC Interface circuit monitors multiple trigger events and controls the power-on sequence.

3. TECHNICAL BRIEF

Figure. PM6650 Functional Block Diagram

3.9.3 Charging control

A programmable charging block in PM6650 is used for battery charging. It is possible to set limits for the charging current. The external supply typically connects directly to pin (VCHG). The voltage on this pin (VCHG) is monitored by detection circuitry to ascertain whether a valid external supply is applied or not. For additional accuracy or to capture variations over time, this voltage is routed internally to the housekeeping ADC via the analog multiplexer. PM6650 circuits monitor voltages at VCHARGER and ICHARGE pins to determine which supply should be used and when to switch between the two supplies. These pins are connected to the Source (or emitter) and Drain (or collector) contacts of the pass transistor respectively.

1) Pass active transistor is "on" – continuously closed-loop controlled to regulate the total current

2) Battery transistor is turned on, connecting battery to VDD node

3) Charging current (blue) flows from the external supply

4) Total current is set by the current regulation loop as described earlier

5) Battery voltage is routed to MSM ; MSM HKADC measures VBAT

6) Constant current charging is finished when the battery reaches its target voltage

| 3.9 ± 0.05V | 3.77 ± 0.05V | 3.7 ± 0.05V | 3.6 ± 0.05V | 3.5 ± 0.05V |

CU500 Battery Bar Display(Stand By Condition)

3. TECHNICAL BRIEF

Trickle Charging

Trickle Charging of the main battery, enabled through SBI control and powered from VDD, is provided by the PM6650 IC, The trickle charger is on-chip programmable current source that supplies current from VDD to pin (VBAT). Trickle charging can be used for lithium-ion and nickel-based batteries, with its performance specified below (3.2V). The charging current is set to 80mA.

Parameter	Min	Typ	Max	Unit
Trickle Current	60	80	100	mA

1) Pass transistor (not shown) is turned ON

2) Battery transistor is turned OFF

3) On-chip programmable current source runs off VDD

4) Current is set by software: 0 (off) to 80 mA; 8 states

5) Charging current (blue) flows out pin 6 (VBAT)

6) Battery voltage is routed to MSM ; MSM HKADC measures VBAT

7) Trickle charging is finished when the battery reaches the desired threshold

"Auto Trickle Charge" feature

When this feature is enabled VBAT is checked as soon as a valid external supply is detected.

- If VBAT < 1V:
  Faulty battery, too low to chg; PM6650 powers up normally

- If 1V < VBAT < 3V:
  Battery good but depleted; trickle charging auto-started. Special algorithm followed.

- If VBAT > 3V:
  Normal PM6650 power-up

Constant Current Charging

The PM6650 IC supports constant current charging of the main battery by controlling the charger pass transistor and the battery transistor. The constant current charging continues until the battery reaches its target voltage, 4.2V.

Constant Voltage Charging

Constant voltage charging begins when the battery voltage reaches a target voltage, 4.2V. The end of constant voltage charging is commonly detected 10% of the full charging current (110mA)
- Charging Method : CC & CV (Constant Current & Constant Voltage)
- Maximum Charging Voltage : 4.2V
- Maximum Charging Current : 650mA
- Nominal Battery Capacity : 1100 mAh
- Charger Voltage : 4.6V
- Charging time : Max 3h (Except time trickle charging)
- Full charge indication current (icon stop current) : 110mA
- Low battery POP UP : Idle - 3.5V, Dedicated(GSM/WCDMA) - 3.6V
- Low battery alarm interval : Idle - 3 min, Dedicated - 1min
- Cut-off voltage : 3.35V

3. TECHNICAL BRIEF

3.10 External memory interface

A. MSM6275

The MSM6275 device was designed to provide two distinct memory interfaces. EBI1 was targeted for supporting high speed synchronous memory devices. EBI2 was targeted towards supporting slower asynchronous devices such as LCD, NAND flash, SRAM, NOR flash etc.

· EBI1 Features

  - 16 bit static and dynamic memory interface
  - 32 bit dynamic memory interface
  - 24 bits of address for static memory devices which can support up to 32MBytes on each chip select
  - Synchronous burst memories supported (burst NOR, burst PSRAM)
  - Synchronous DRAM memories supported
  - Byte addressable memory supporting 8 bit, 16 bit and 32 bit accesses
  - Pseudo SRAM (PSRAM) memory support

· EBI2 Features

  - Support for asynchronous FLASH and SRAM(16bit & 8bit).
  - Interface support for byte addressable 16bit devices(UB_N & LB_N signals).
  - 2Mbytes of memory per chip select.
  - Support for 8 bit/16bit wide NAND flash.
  - Support for parallel LCD interfaces, port mapped of memory mapped(18 or 16 bit)

· 512Mb NAND(8bit) flash memory + 512Mb SDRAM (32bit)

· 1-CS(Chip Select) are used

Interface Spec				
Device	Part Name	Maker	Read Access Time	Write Access Time
FLASH	TY90009800C0GG	Toshiba	50 ns	50 ns
SDRAM	TY90009800C0GG	Toshiba	15 ns	15 ns

Table#1. External memory interface for CU500

3.11 H/W Sub System

3.11.1 RF Interface

A. RTR6250(WCDMA_Tx, GSM_Tx/Rx)

MSM6275 controls RF part(RTR6250) using these signals.

· SBST,SBDT,SBCK : SBI I/F signals for control Sub-chipset

· PA_ON0, PA_ON1 : Power AMP on RF part

· RX0_I/Q_M/P,TX_I/Q_M/P: I/Q for T/Rx of RF

· TX_AGC_ADJ : control the gain of the Tx signal prior to the power amplifier

U200-1
MSM6275_A
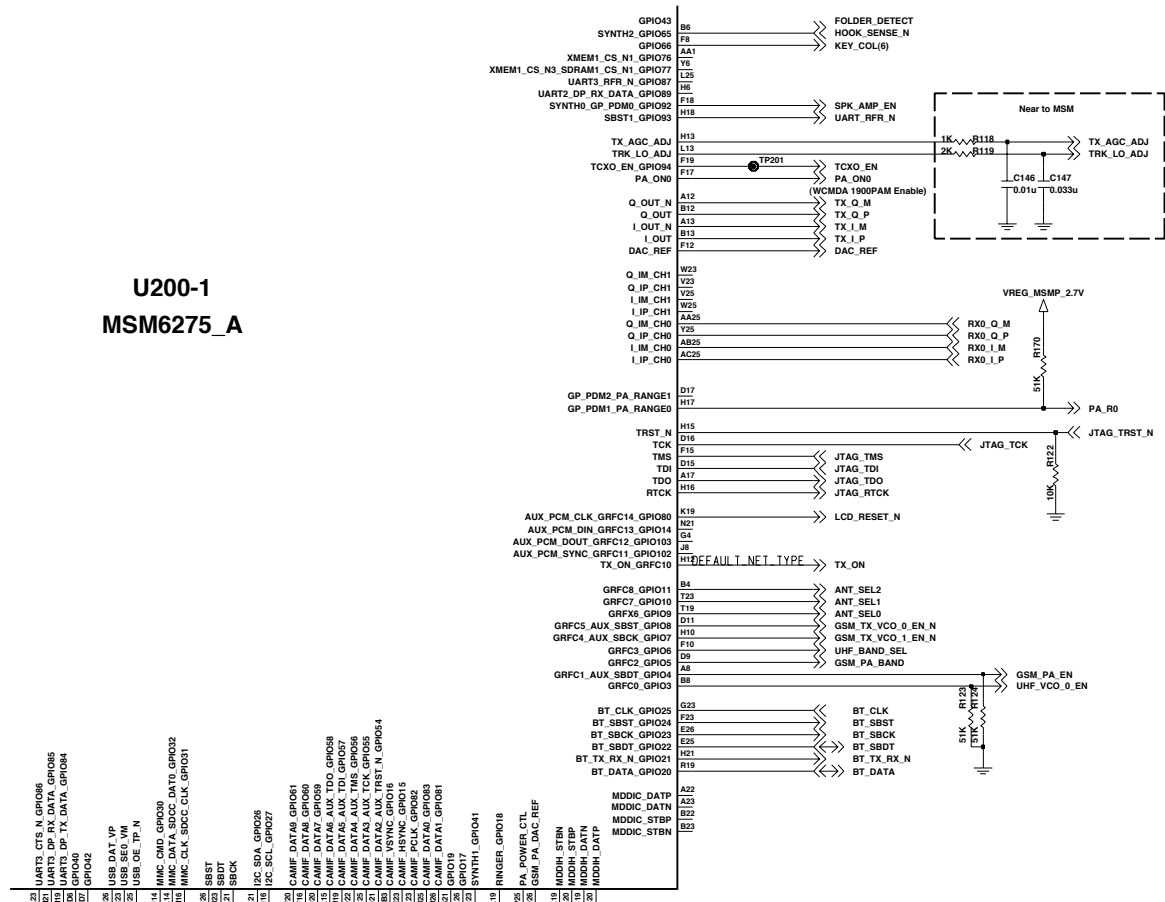
Figure. Schematic of RF Interface of MSM6275

3. TECHNICAL BRIEF

B. RFR6202(WCDMA_Rx)
・SBST,SBDT,SBCK : SBI I/F signals for control Sub-chipset
・RX0_I/Q_M/P : I/Q for Rx of RF

C. RFL6202(WCDMA_Rx_LNA)
・SBST,SBDT,SBCK : SBI I/F signals for control Sub-chipset

D. the others
・UHF_BAND_SEL : WCDMA(3G) VCO Band Selection of UHF VCO
・UHF_VCO_0_EN : WCDMA(3G) UHF VCO Enable
・TRK_LO_ADJ : TCXO(19.2M) Control
・PA_ON0 : WCDMA(1900) TX Power Amp Enable
・PA_ON1: WCDMA(850) TX Power Amp Enable
・ANT_SEL[0-2] : Ant Switch Module Mode Selection(WCDMA,GSM Tx/Rx,DCS-PCS Tx/Rx)
・GSM_PA_BAND : GSM/DCS-PCS Band Selection of Power Amp
・GSM_PA_RAMP : Power Amp Gain Control of APC_IC
・GSM_PA_EN : Power Amp Gain Control Enable of APC_IC
・GSM_TX_VCO_0_EN_N : GSM Band Tx VCO Enable of Dual VCO
・GSM_TX_VCO_1_EN_N : DCS-PCS Band Tx VCO Enable of Dual VCO

3.11.2 MSM Sub System

3.11.2.1. USIM Interface
SIM interface scheme is shown in Figure.
And, there control signals are followed
・USIM_CLK : USIM Clock
・USIM_Reset : USIM Reset
・USIM_Data : USIM Data T/Rx
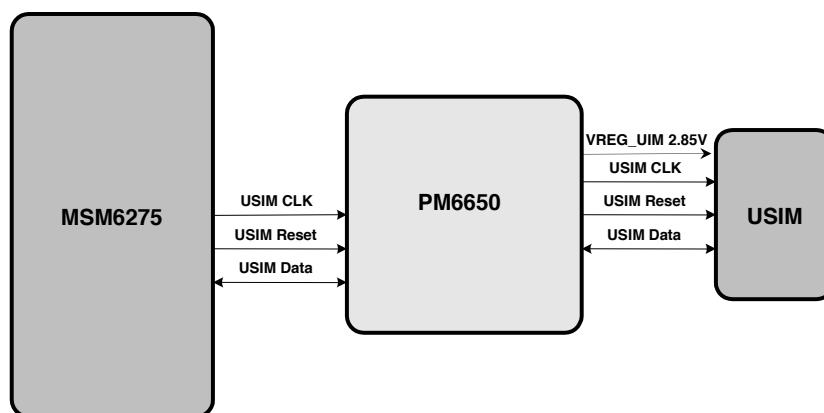
Figure. SIM Interface

3.11.2.2. UART Interface

UART signals are connected to MSM GPIO through IO connector with 115200 bps speed.

GPIO_Map	Name	Note
GPIO_96	UART_RXD	Data_Rx
GPIO_95	UART_TXD	Data_Tx

Table. UART Interface

3.11.2.3. USB

The MSM6275 device contains a Universal Serial Bus (USB) interface to provide an efficient interconnect between the mobile phone and a personal computer (PC). The USB interface of the MSM6275 was designed to comply with the definition of a peripheral as specified in USB Specification, Revision 1.1. Therefore, by definition, the USB interface is also compliant as a peripheral with the USB Specification, Revision 2.0. The USB Specification Revision 1.1 defines two speeds of operation, namely low-speed (1.5 Mbps) and full-speed (12 Mbps), both of which are supported by the MSM6275.

Name	Note
USB_DAT	Data to/from MSM
USB_SE0	Data to/from MSM
USB_OE_N	Out-Put Enable of Transceiver
USB_VBUS	USB_Power From Host(PC)
USB_D+	USB Data+ to Host
USB_D-	USB Data- to Host

Table. USB Signal Interface

3. TECHNICAL BRIEF

Figure. Schematic of USB block(MSM6275 Side & PM6650 Side)

CU500 have a protective circuit for booting from USB. When the phone is booting from USB_VBUS without Battery, booting current is insufficient. Sometimes that can break the USB port of a computer. For this reason, CU500 do not support booting from USB.

Figure. Schematic of USB protective circuit

3.11.3 HKADC(House Keeping ADC)

The MSM6275 device has an on-chip 8-bit analog-to-digital converter (HKADC) which is tended to digitize DC signals corresponding to analog parameters such as battery voltage, temperature, and RF power levels. The MSM6275 device has six analog input pins which are multiplexed to the input of the internal HKADC.
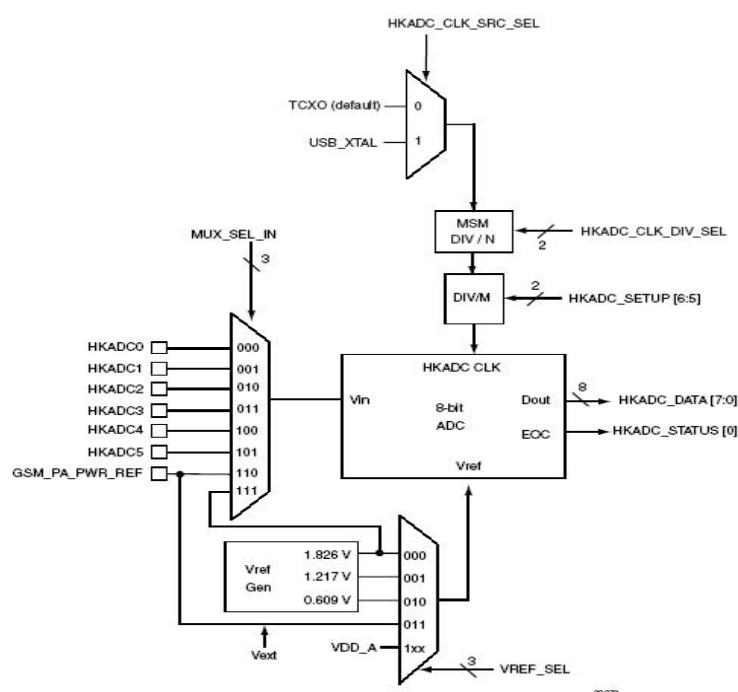
Figure. MSM6275 HKADC Block diagram

ADC Ch#	Signal Name	Note
HKADC0	AMUX_OUT	RF PAM Temperature Check
HKADC1	VBATT_SENSE	Battery voltage level
HKADC2	HDET1	RF PAM Power Level Detector
HKADC3	TTY_ADC_DET	Ear jack Detection for TTY
HKADC4	PCB_Rev_ADC	PCB Version Check
HKADC5	CHARGER_THERM	Battery Temperature Check

Table. HKADC channel table

3.11.4 Key Pad

There are 24 buttons and 3 side keys in Figure. Shows the Keypad circuit. 'END' Key is connected On_SW to PMIC(PM6650).

	COL0	COL1	COL2	COL3	COL4	COL5	COL6
ROW0			MP3	C/BACK	MENU	Side (up)	MOD (FF)
ROW1	1	2	3	Left	Up	Side (down)	MOD (Play/Pause)
ROW2	4	5	6	OK	Right	Side (function)	MOD (REW)
ROW3	7	8	9	SEND	Option		
ROW4	*	0	#	Down	Camera		

Figure. Keypad Circuit

ON_SW
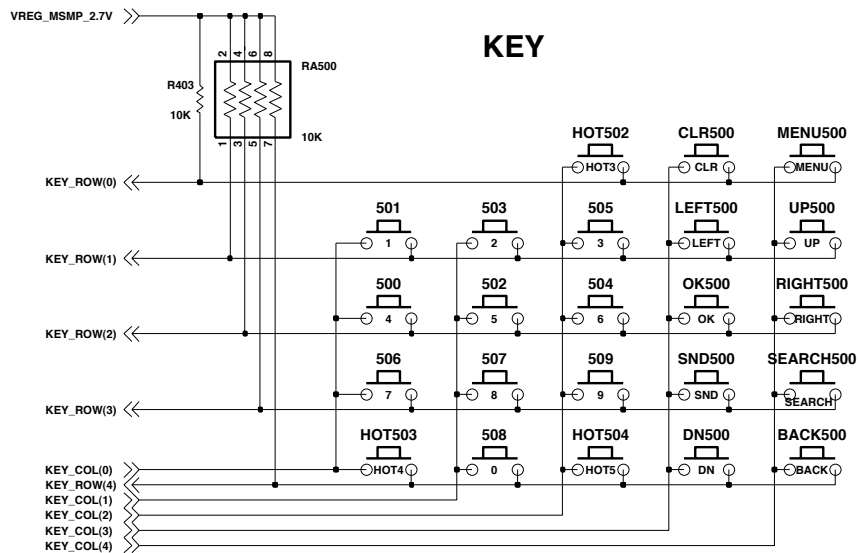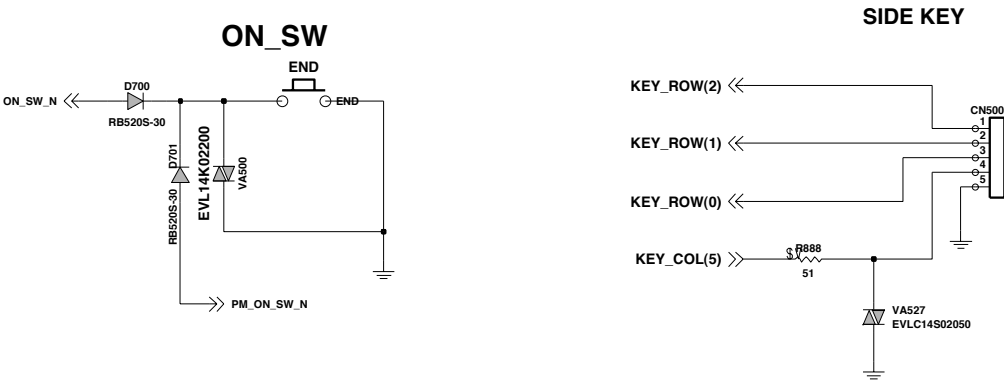
SIDE KEY

Figure. Keypad Circuit (END KEY & Side KEY)
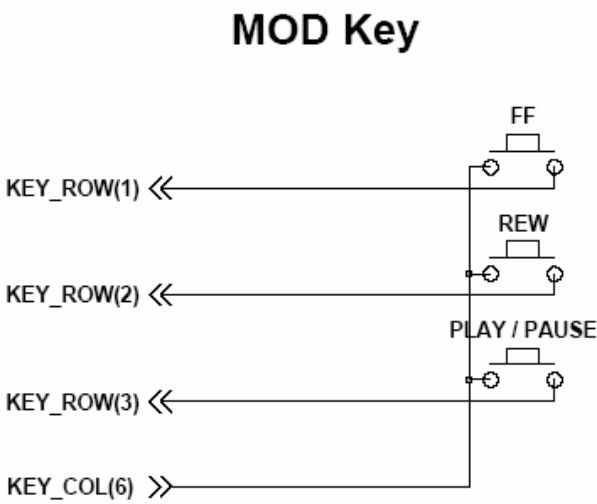
MOD Key

Figure. Keypad Circuit (MOD KEY)

3. TECHNICAL BRIEF

3.11.5 Camera Interface

CU500 Installed a 1.3M Pixel CMOS VGA Camera.

Below figure shows the camera board to board connector and camera I/F signal.

Figure. Camera Board to Board Connector

The Camera module is connected to main board with 24pin Board to Board connector (AXK7L24227). Its interface is dedicated camera interface port in MSM6275. The camera port supply 12MHz master clock to camera module and receive 36MHz pixel clock (11.25fps), vertical sync signal, horizontal sync signal, reset signal and 8bits data from camera module. The camera module is controlled by I2C port from MSM6275.

No	Name	Port	Note
1	GND	GND	GND
2	CAM_PWDN	I	Camera power down
3	CAM_MCLK	I	Master Clock(12M)
4	CAM_DATA(3)	O	Data
5	CAM_DATA(0)	O	Data
6	CAM_PCLK	O	Clock for Camera Data Out(36M)
7	CAM_DATA(2)	O	Data
8	CAM_DATA(1)	O	Data
9	CAM_VSYNC	O	Vertical Synch
10	CAM_DATA(5)	O	Data
11	CAM_DATA(4)	O	Data
12	VREG_CAM_1.8V	I	Camera Digital Power
13	GND	GND	GND
14	GND	GND	GND
15	VREG_CAM_2.7V	I	Camera Analog Power
16	GND	GND	GND
17	I2C_SCL	I	I2C Clock
18	CAM_RESET_N	I	Camera reset signal
19	VREG_MSMP_2.7V	I	Camera I/O Power
20	CAM_HSYNC	O	Horizontal Sync
21	I2C_SDA	I/O	I2C command
22	CAM_DATA(6)	O	Data
23	CAM_DATA(7)	O	Data
24	GND	GND	GND

Table. Interface between Camera Module and Main Board (in camera module)

3. TECHNICAL BRIEF

3.11.6 Folder ON/OFF Operation

There is a magnet to detect the Folder status, opened or closed.

If a magnet is close to the hall-effect switch, the voltage at pin1 of U504 goes to 0V. Otherwise, 2.6V.

This folder signal is delivered to MSM6275 GPIO43.

(For Hall Sensor)
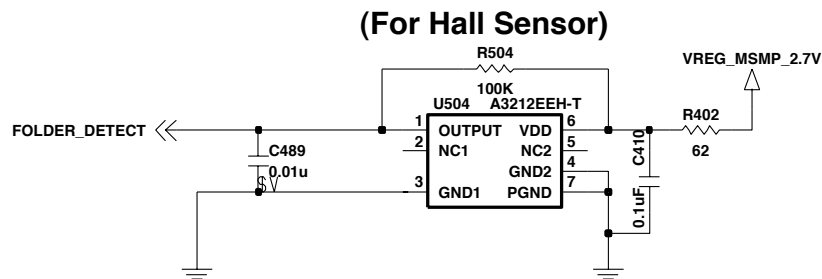
Figure. Schematic of Folder ON/OFF detection circuit

3.11.7 Keypad Light

There are 16 White LEDs in Main board backlight circuit, which are driven by KYBD_BACKLIGHT line from PM6650.
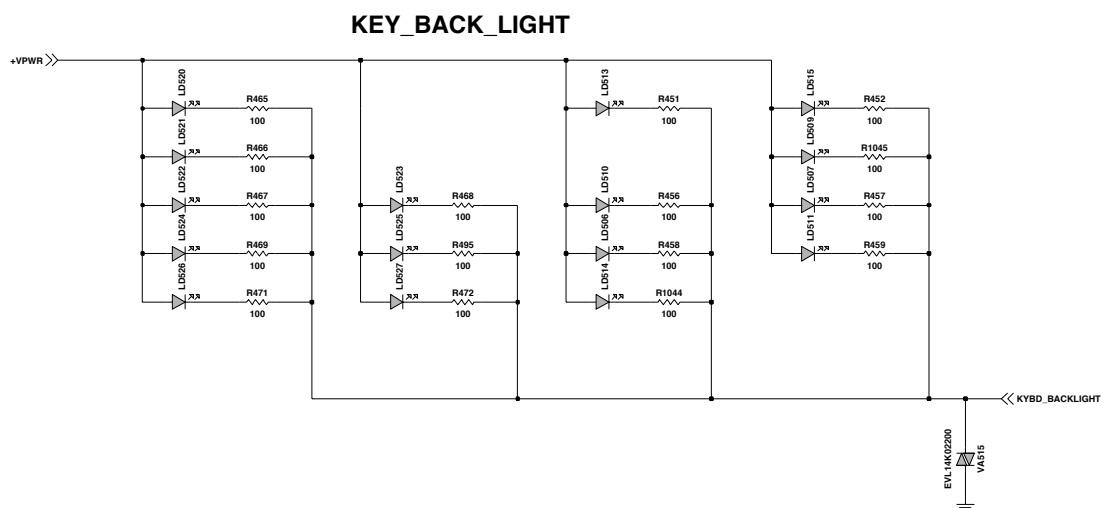
KEY_BACK_LIGHT

Figure. Keypad Backlight Circuit

3.11.8 LCD Module (IM200CST4B : LG Innotek)

- The IM200CST4B model is a Color TFT(Main & Sub) LCD supplied by LG Innotek. This main Module has a 2.0 inch diagonally measured active display area with 176(RGB)X220 resolution and sub Module has a 1.17 inch diagonally measured active display area with 96(RGB)X96 resolution. Each pixel is divided into Red, Green and Blue sub-pixels and dots which are arranged in vertical stripes.

* Features

- Display mode : Normally White, Transmissive TN mode 262K colors

- LCD Driver : HCD66784RBP (All-in-One)

- Driving Method : A-Si TFT Active Matrix

- 18 bit CPU interface Parallel
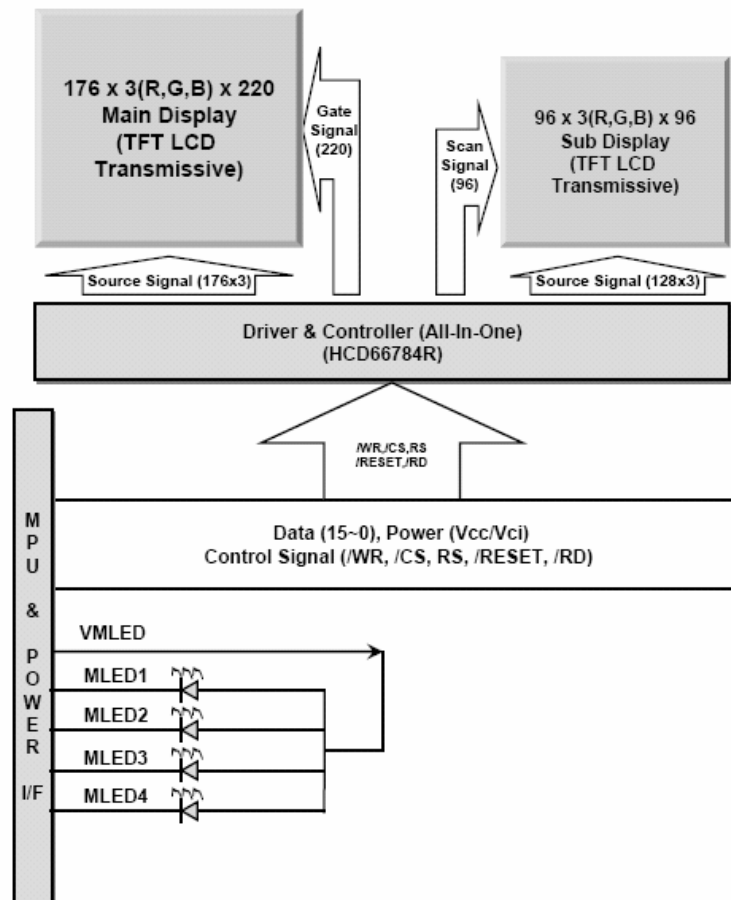
Figure. LCD Module Block Diagram

3. TECHNICAL BRIEF

3.11.9 Display & LCD FPC Interface

LCD module is connected to LCD FPCB with 50-pin Zip connector (AXT450164 / Matsushita)
The LCD module is controlled by 16-bit EBI2 in MSM6275

Pin No.	Symbol	Description	Remark
1	VDD	I	Power Supply for internal logic regulator circuits
2	Vci	I	Power Supply for analog circuit
3	N.C	-	Non- Connection
4	/RESET	I	Reset Pin. Initialize the LSI at the low level
5	D0	I/O	Bi-Directional Data Bus
6	D1	I/O	Bi-Directional Data Bus
7	D2	I/O	Bi-Directional Data Bus
8	D3	I/O	Bi-Directional Data Bus
9	D4	I/O	Bi-Directional Data Bus
10	D5	I/O	Bi-Directional Data Bus
11	D6	I/O	Bi-Directional Data Bus
12	D7	I/O	Bi-Directional Data Bus
13	D8	I/O	Bi-Directional Data Bus
14	D9	I/O	Bi-Directional Data Bus
15	VLED	O	Power Supply for LED(B/L)
16	LED1	O	LED1 Cathode Connection
17	LED2	O	LED2 Cathode Connection
18	LED3	O	LED3 Cathode Connection
19	LED4	O	LED4 Cathode Connection
20	GND	-	Ground
21	GND	-	Ground
22	RD/	I	Read-Strobe Signal Active low
23	ID(MAKER)	I	Distinction of LCD maker (LGIT: GND)
24	VDD	I	Power Supply for internal logic regulator circuits
25	Vci	I	Power Supply for analog circuit
26	IM3	I/O	Mode Select. High(IM3)/Low(IM0):18Bit(262K)
27	IM0	I/O	
28	D17	I/O	Bi-Directional Data Bus
29	D16	I/O	Bi-Directional Data Bus
30	D15	I/O	Bi-Directional Data Bus
31	D14	I/O	Bi-Directional Data Bus
32	D13	I/O	Bi-Directional Data Bus
33	D12	I/O	Bi-Directional Data Bus
34	D11	I/O	Bi-Directional Data Bus
35	D10	I/O	Bi-Directional Data Bus
36	ADS(RS)	I	Select the Register. High : Control, Low : Index/Status
37	/CS	I	Chip Select. Active low
38	WR/	I	Write-Strobe Signal. Active low
39	Vsync OUT	-	FLM
40	GND	-	Ground

3.11.9.1. Audio Signal Processing & Interface

Audio signal processing is divided uplink path and downlink path.

The uplink path amplifies the audio signal from MIC and converts this analog signal to digital signal and then transmits it to DBB Chip (MSM6275).

This transmitted signal is reformed to fit in GSM & WCDMA frame format and delivered to RF Chipset. The downlink path amplifies the signal from DBB chip (MSM6275) and outputs it to receiver (or speaker).

The receive path can be directed to either one of two earphone amplifiers or the auxiliary output. The outputs earphone1 (EAR1OP, EAR1ON) and auxiliary out (AUXOP, AUXON) are differential outputs. Earphone2 (EAR2/EAR3) is a single-ended output stage designed to drive a headset speaker.

The microphone interface consists of two differential microphone inputs, one differential auxiliary input and a two-stage audio amplifier.
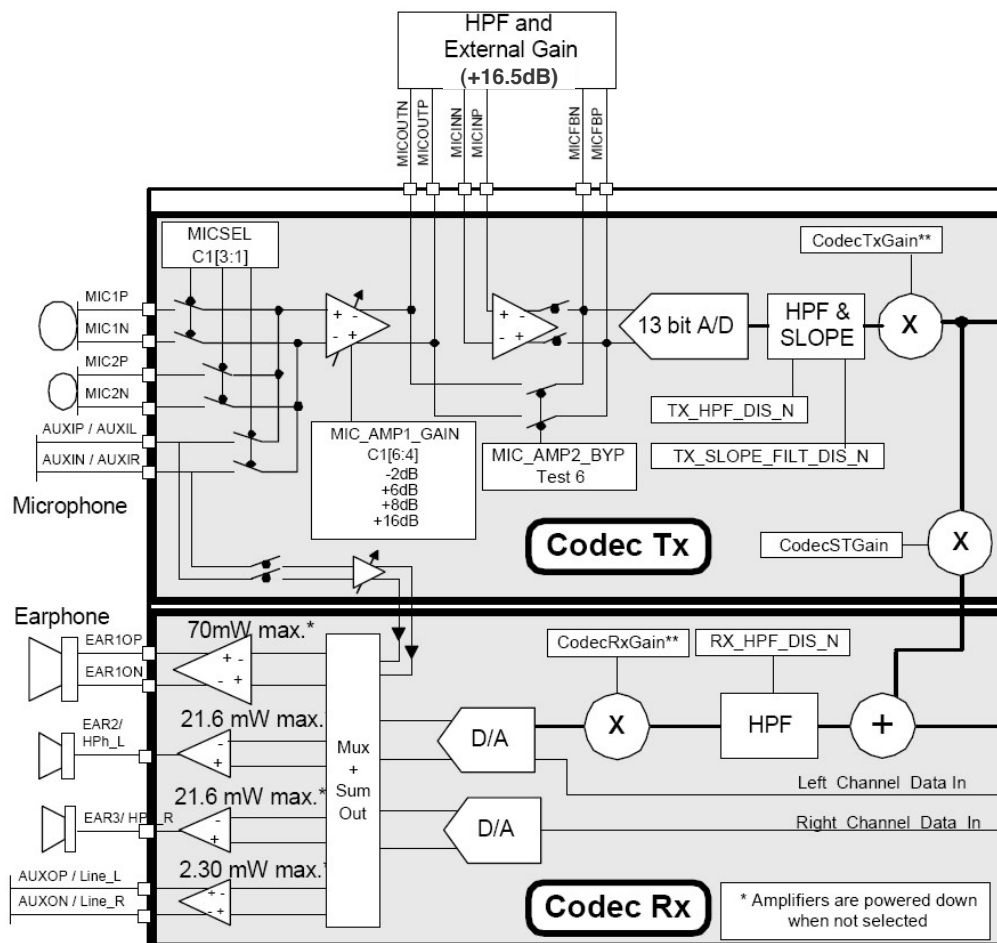
Figure. Audio Interface Detailed Diagram(MSM6200)

3. TECHNICAL BRIEF

MSM6275 CODEC pins

Microphone external gain network

MICFBN

MICINP

R100 10% 0.1u C100 10% 0.1u C101 **MICOUTN**
180K

0.015u C103 R101 10K

R102 470K

0.015u C104 R104 10K

R111 10% 0.1u C106 10% 0.1u C107 **MICOUTP**
180K

MICINN

MICFBP

Place close to MSM under same Shield

Figure . Audio part schematics

Audio AMP

Microphone

MIC
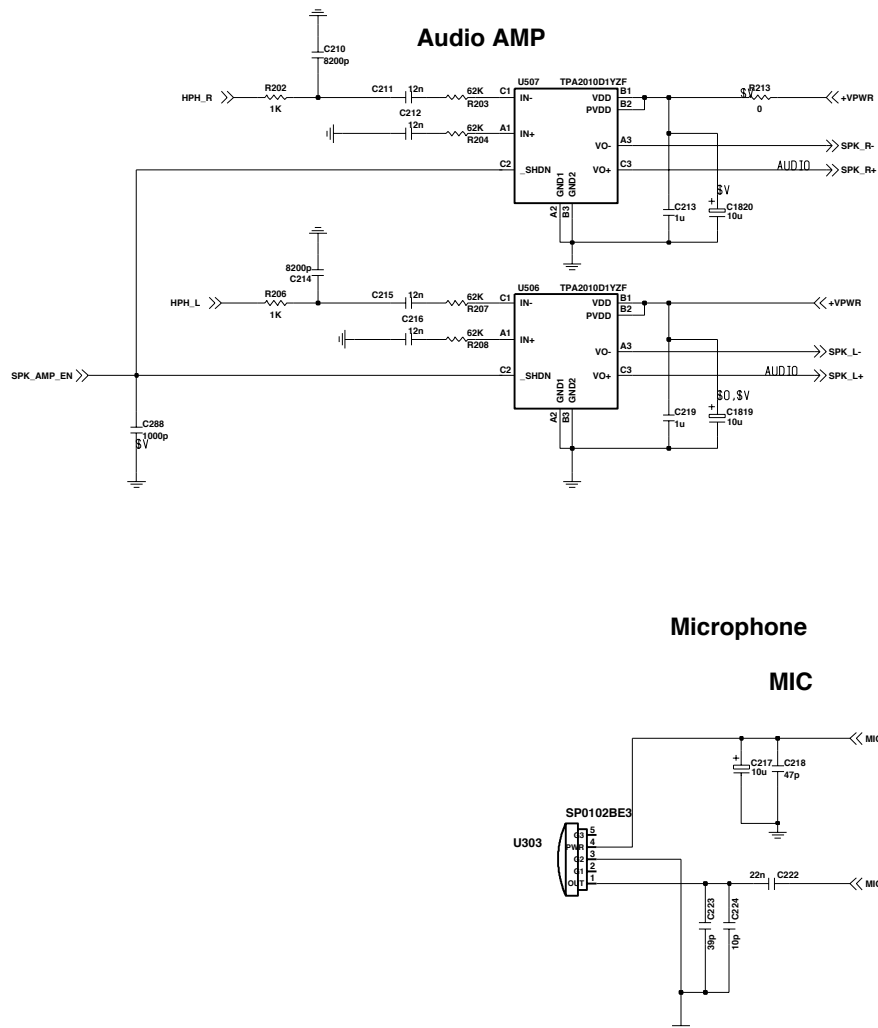
Figure . Audio part schematics

3. TECHNICAL BRIEF

3.11.9.2. Audio Mode

There are three audio modes (Voice call, speaker phone, MIDI/MP3).

MODE	Device	Description
Voice Call	Receiver Mode	Receiver Voice Call
	Loud Mode	Speaker Phone
	Headset	Headset Voice Call
Speaker phone	Loud Mode	Speaker Phone
MIDI	Loud Mode	Speaker MIDI Bell
	Headset	Headset MIDI Bell
MP3	Loud Mode	Speaker MP3
	Headset	Headset MP3

Table. Audio Mode

Audio & Sound Main Component

There are 6 main components in CU500.

	Component	Design No.	Maker Part No.	Note
1	MSM6275	U200	MSM6275	Base-Band Modem
2	Audio amp	U507,U506	TPA2010D1YZF	Class-D Audio Amp
3	Loud Speaker		EMS1735AP	8 ohm Speaker
4	Receiver		EMR1107SP	32 ohm receiver
5	MIC	U303	SP0102BE3	-42 dB microphone
6	Ear jack	CON100	KJA-PH-3-0059	Ear jack

Table. Audio main component list

3. TECHNICAL BRIEF

3.12 Main Features

1. LG-CU500 Main features

- Dual Clamshell Type
- WCDMA(850, 1900) + EDGE Quad(Class10) + HSDPA(1.8Mhz)
- Color LCD(Main:262K TFT, 2', Sub : 65K TFT)
- 1.3M Pixel CMOS VGA Camera
- dual 15 phi speaker
- Stereo Headset
- Speaker phone(in GSM and WCDMA)
- 72 Poly Sound
- MP3/AAC decoder and play
- MPEG4 encoder/decoder and play/save
- JPEG en/decoder
- Supports Bluetooth, USB
- 1,100 mAh (Li-Ion)

2. CU500 Main Component

Logic /Audio

RF

Logic /Audio

Bluetooth
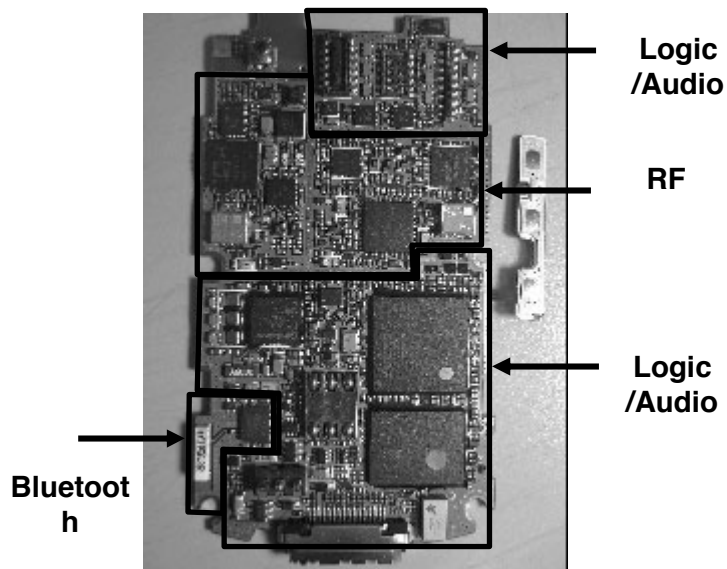
Main board, Bottom
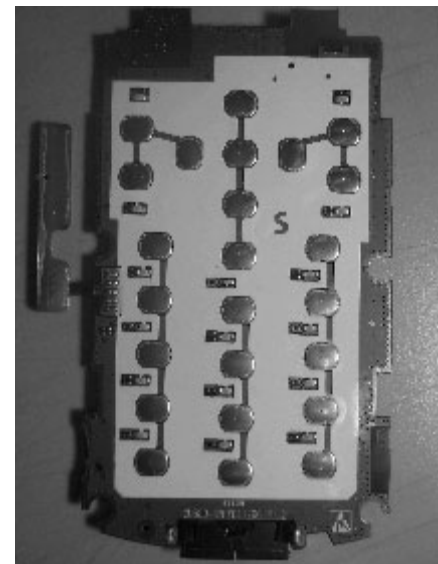
Main board, Top
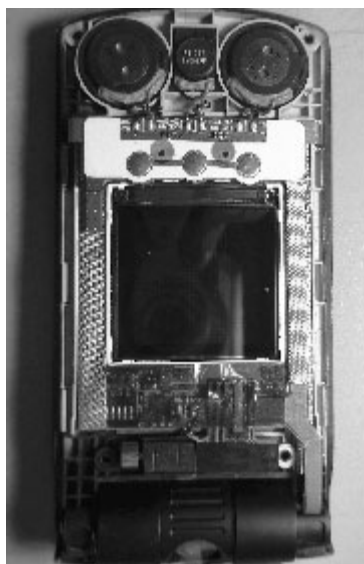
LCD FPCB
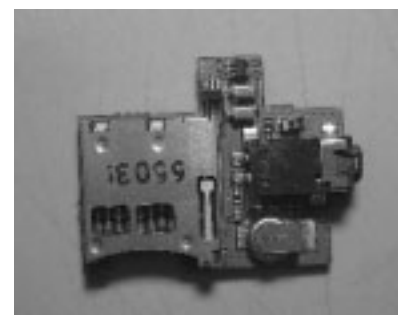
Sub board

3. TECHNICAL BRIEF

RF
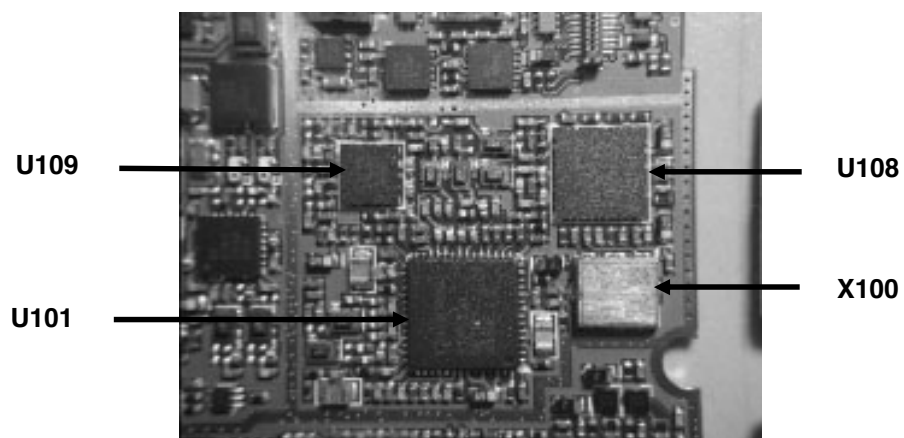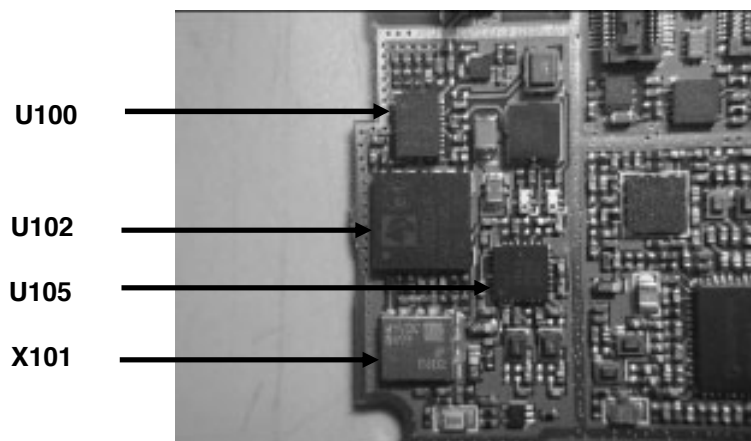
Reference	Description	Reference	Description
U100	Ant. Switch module	U109	RFL6202
U102	GSM PAM	U101	RTR6250
U105	WCDMA PAM	U108	RFR6202
X101	GSM VCO	X100	UHF VCO

Audio/logic
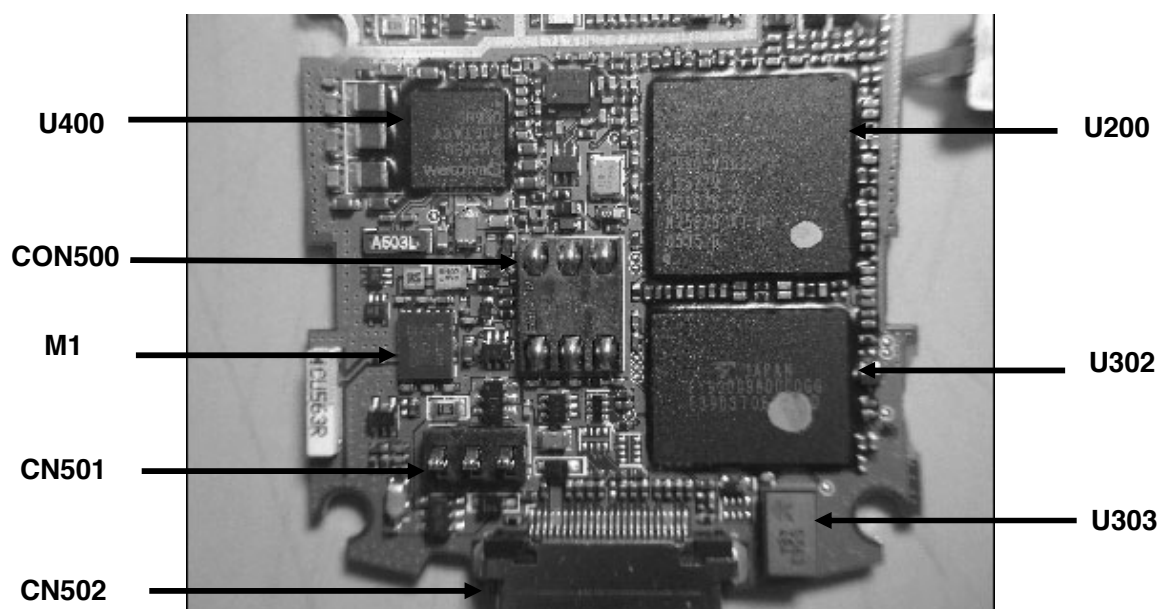
Reference	Description	Reference	Description
U400	PMIC	CN502	IO connector
CON500	USIM connector	U200	MSM6275
M1	BT module	U302	Memory
CN501	Battery connector	U303	Microphone

3. TECHNICAL BRIEF

ETC
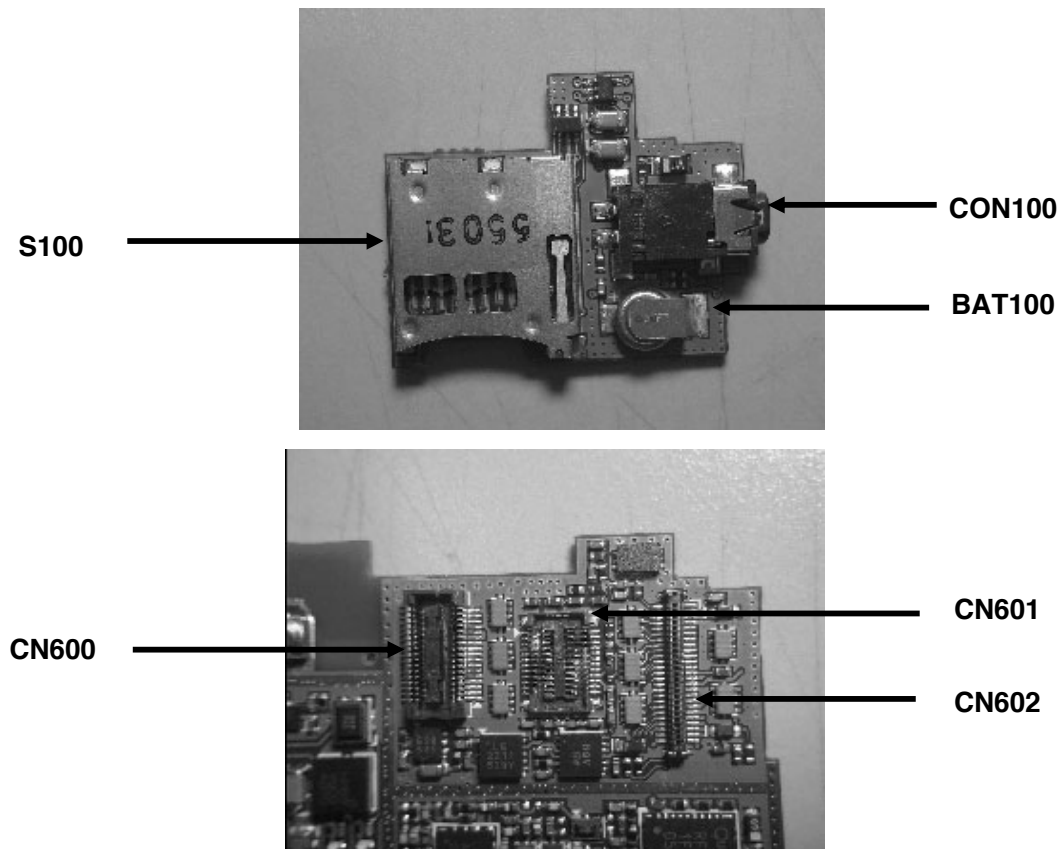
Reference	Description	Reference	Description
S100	Micro SD card slot	CN600	Sub PCB connector
CON100	Ear_jack connector	CN601	Camera connector
BAT100	Coin cell battery	CN602	LCD connector

4. TROUBLE SHOOTING

4.1 RF Component

Bottom Side
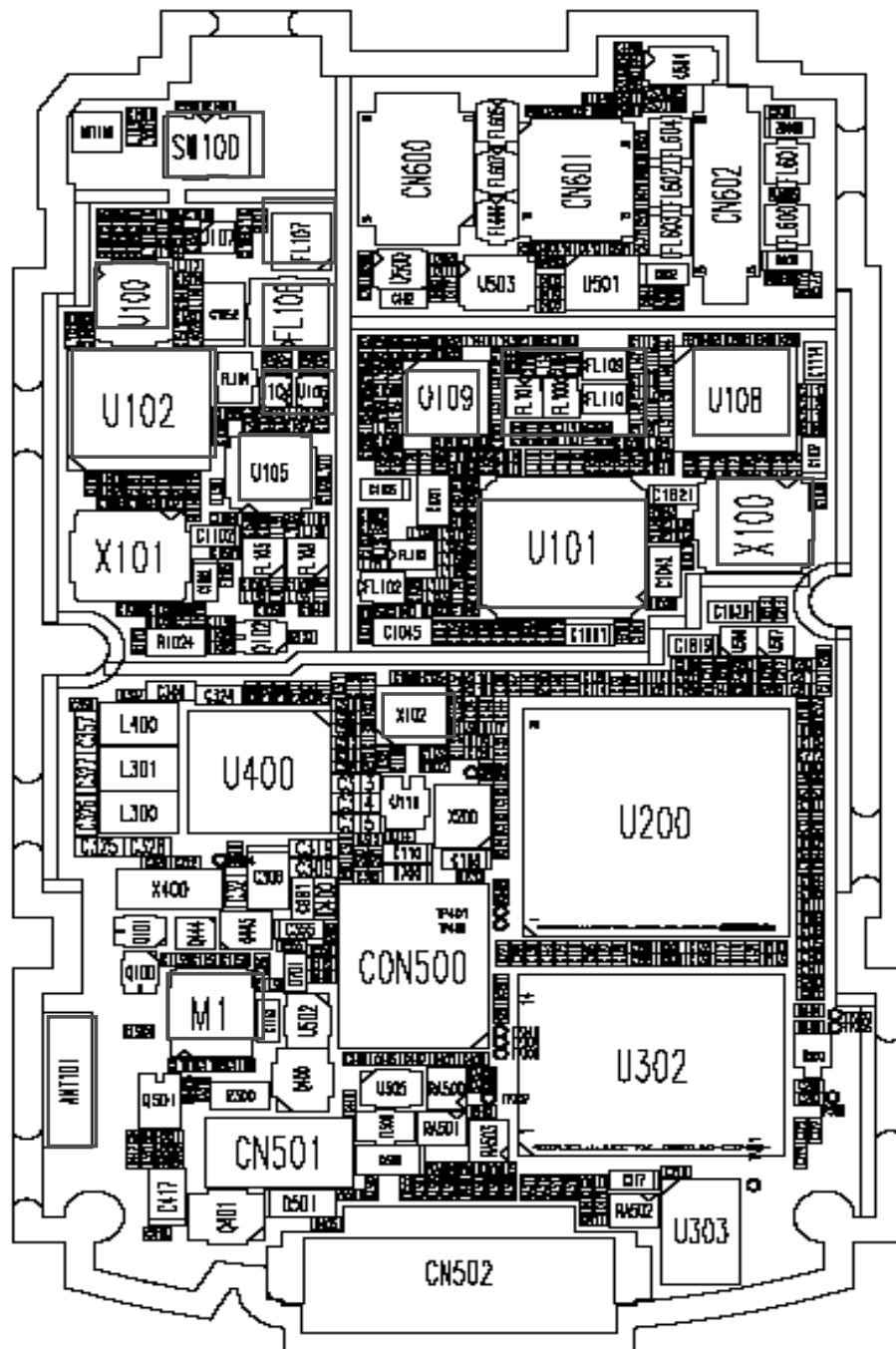
4. TROUBLE SHOOTING

Block Diagram Block	Ref. Name	Part Name	Function	Comment
Common	U101	RTR6250	UMTS/GSM Transceiver	TRX
	X100	MQW541A1G44	VCO for UMTS RX and GSM Calibration.	RX, Calibration
	U100	CXG1198AEQ	Switch	Band select
	SW100	KMS-507	Test Connector	Calibration, etc
	X102	TG-5001LA-19.2MHz	VCTCXO	19.2MHz
Bluetooth	M1	RB06A	Bluetooth RF Transceiver	Bluetooth TRX
	ANT101	ACS2450HBAM 6	Antenna	Bluetooth antenna
UMTS	U108	RFR6202	UMTS Receiver IC	RX
	U109	RFL6202	UMTS RX LNA IC	RX
	FL110	B7847	WCEMA1900 RX SAW filter	RX
	FL109	B7838	UMTS850 RX SAW filter	RX
	FL107	B7637	UMTS 850 Duplexer	TRX
	FL106	ACMD-7402	UMTS 1900 Duplexer	TRX
	U105	RF5144	UMTS dual PA	TX
	U104	HHM2221SA3	UMTS 850 coupler	TX
	X100	MQW541A1G44	UMTS VCO	RX
	U107	LMV232TLX	UMTS HDET	Power dector
	FL105	B9014	UMTS 1900 TX SAW Filter	TX
	FL108	B9003	UMTS 850 TX SAW Filter	TX
GSM	U102	AND0041	TX Dual PAM	TX
	X101	MQW5V0C869M	VCO	Dual TX VCO
	FL100	B7845	RX SAW Filter	GSM850 RX
	FL101	B7851	RX SAW Filter	PCS RX
	FL102	B7844	RX SAW Filter	GSM900 RX
	FL103	B7837	RX SAW Filter	DCS RX

4.2 SIGNAL PATH_UMTS RF
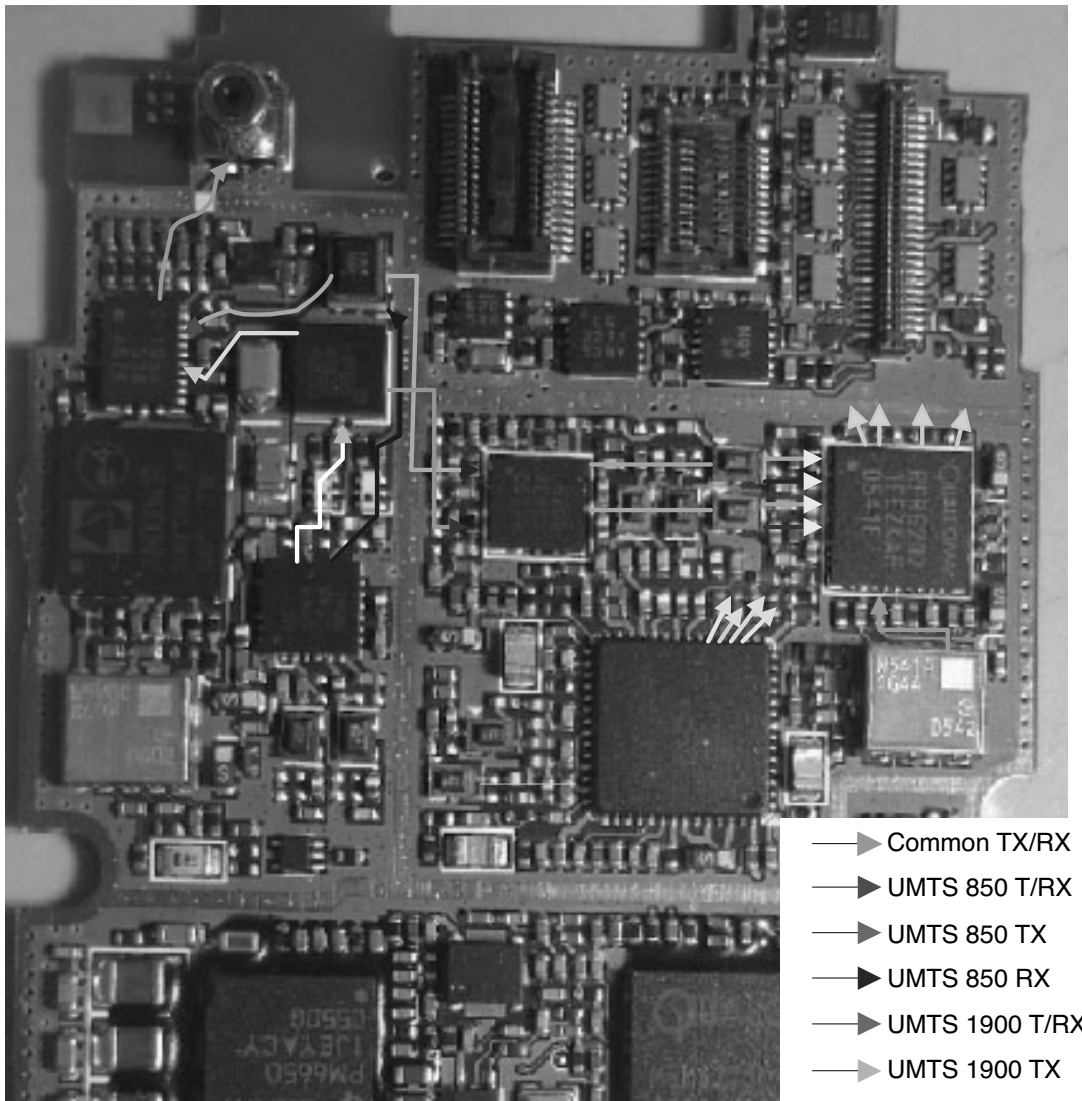
→	Common TX/RX
→	UMTS 850 T/RX
→	UMTS 850 TX
→	UMTS 850 RX
→	UMTS 1900 T/RX
→	UMTS 1900 TX
→	UMTS 1900 RX
→	TX I/Q
→	RX I/Q
→	LO

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SIGNAL PATH_GSM RF

Common TX/RX

DCS RX

PCS RX

GSM850 RX

GSM900 RX

DCS/PCS TX

GSM850/GSM900 TX

TX I/Q

TX_MOD_CP
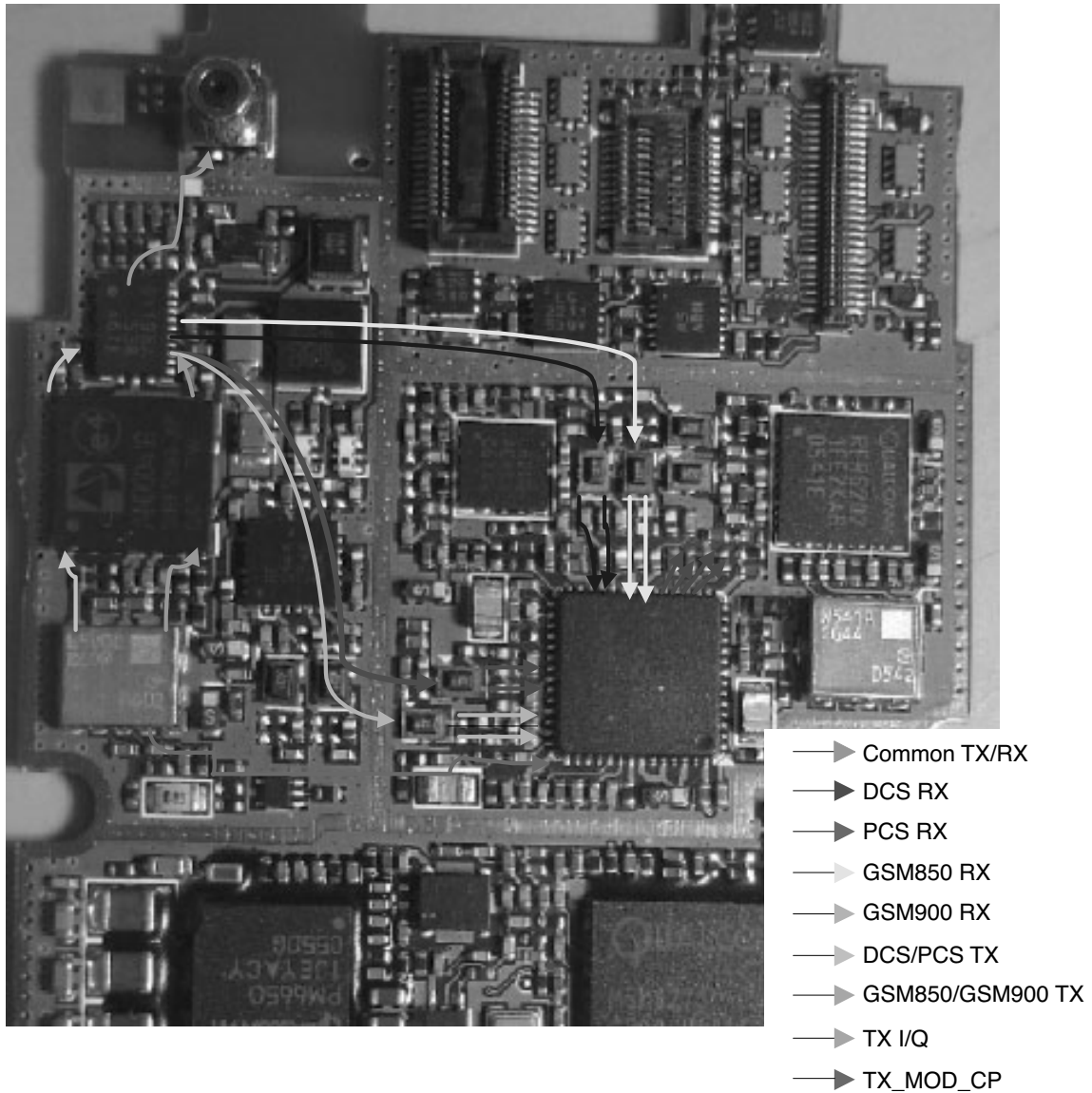
4.3 Checking VCXO Block

The reference frequency (19.2MHz) from X102 (VCXO) is used in UMTS TX part, GSM part and BB part.

Check 1. Crystal part

If you already check this crystal part, you can skip check 1.
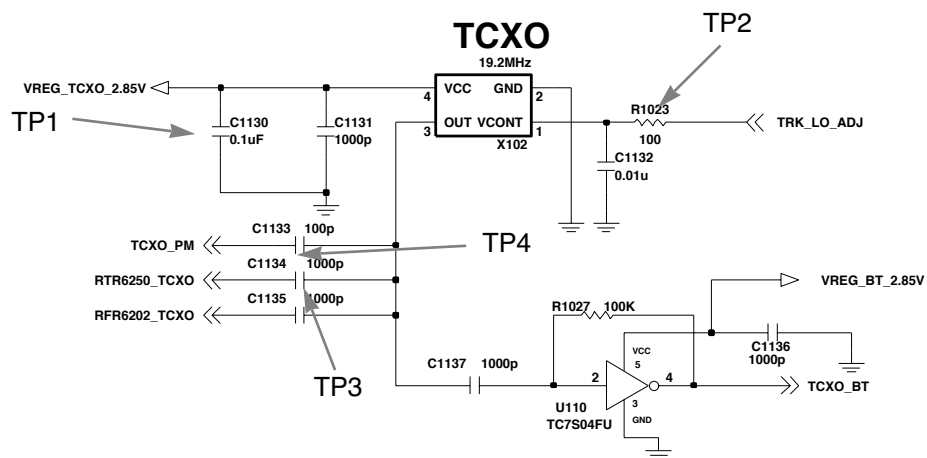
Schematic of the Crystal Part
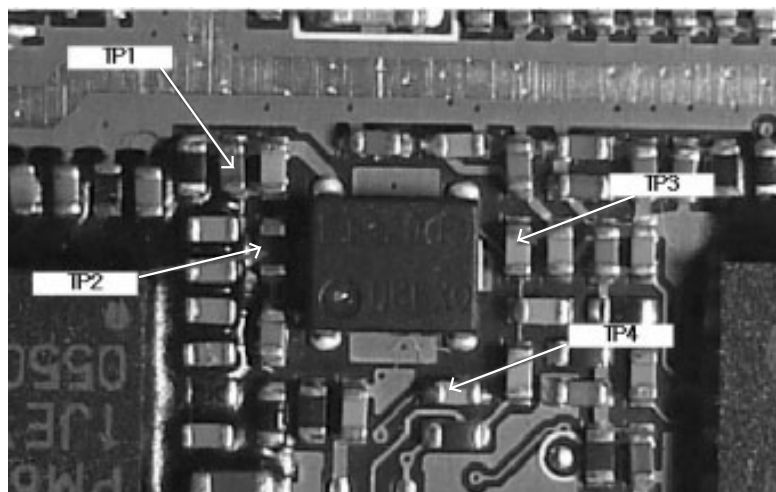
Test Point (Crystal Part)

4. TROUBLE SHOOTING

```
┌─────────────────────┐
│     Check TP1        │
│    VCC of VCXO       │
└─────────────────────┘
           │
           ▼
      ╱─────────╲            NO      ┌──────────────────────────┐
     ╱ VCC ≥ 2.8 V ╲ ───────────────▶│ Check R400 of PMIC (U400) │
      ╲─────────╱                    └──────────────────────────┘
           │ YES
           ▼
┌─────────────────────┐
│     Check TP2        │
│     TRK_LO_ADJ       │
└─────────────────────┘
           │
           ▼
      ╱──────────────╲       NO      ┌──────────────────────────┐
     ╱ 2V ≥ Voltage ≥ 1V ╲ ─────────▶│ Check R223 of MSM (U200)  │
      ╲──────────────╱               └──────────────────────────┘
           │ YES
           ▼
┌─────────────────────┐
│    Check TP3,4       │
│  With Oscilloscope   │
└─────────────────────┘
           │
           ▼
      ╱──────────────╲       NO      ┌──────────────────────────┐
     ╱ 2V ≥ Voltage ≥ 1V ╲ ─────────▶│     Check soldering       │
      ╲──────────────╱               │     and components        │
           │ YES                     └──────────────────────────┘
           ▼
┌─────────────────────┐
│     VCXO is OK        │
│   Check other part    │
└─────────────────────┘
```
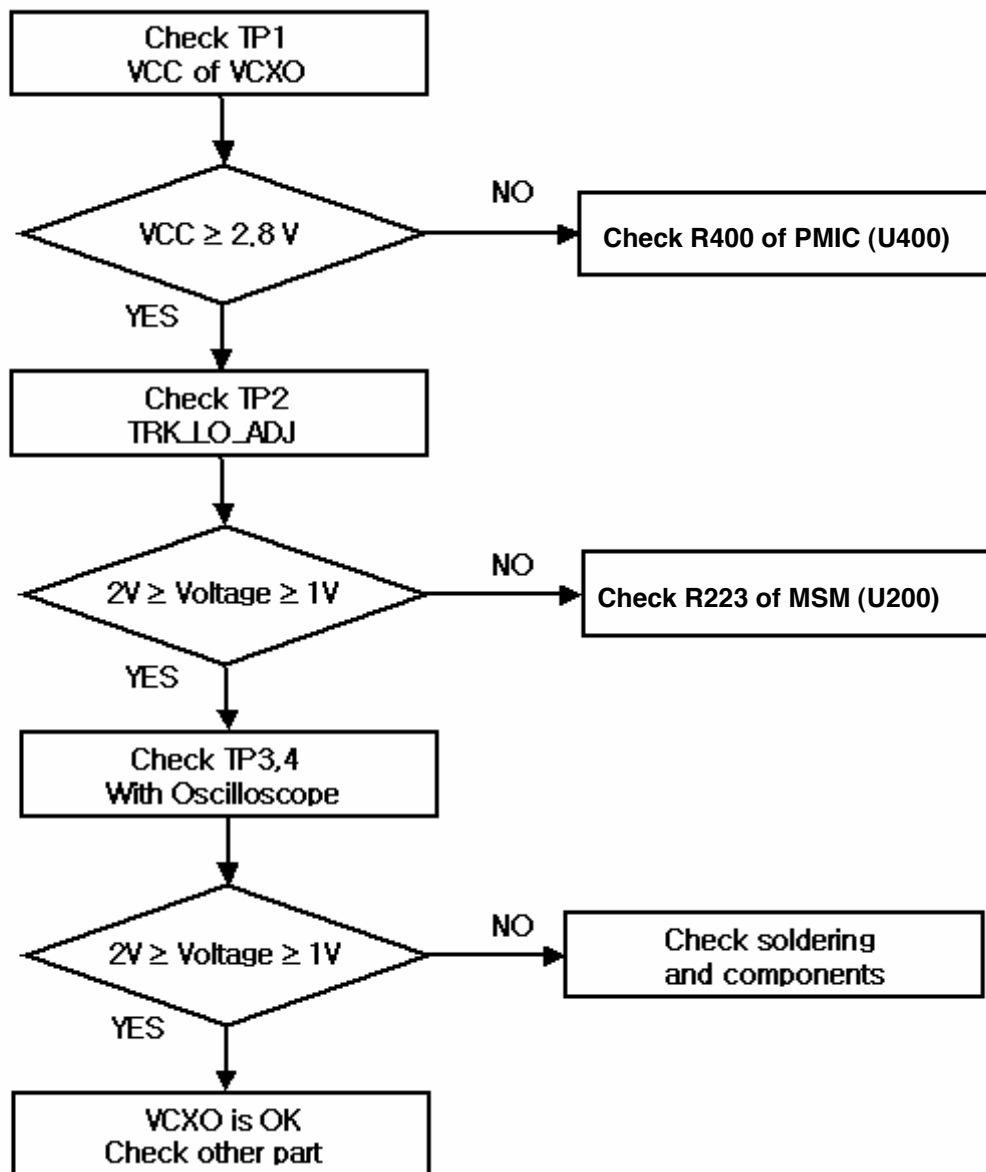
4.4 Checking Ant. SW Module Block
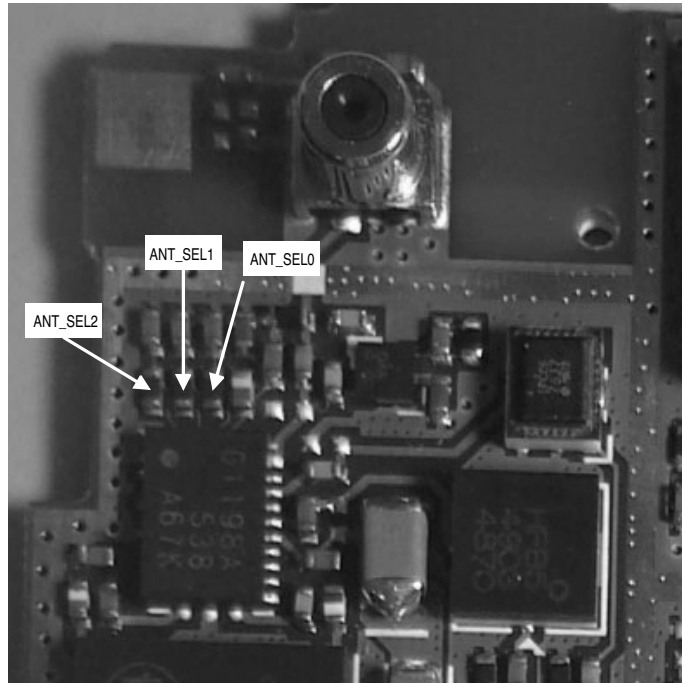
Antenna Switch Block(Bottom)
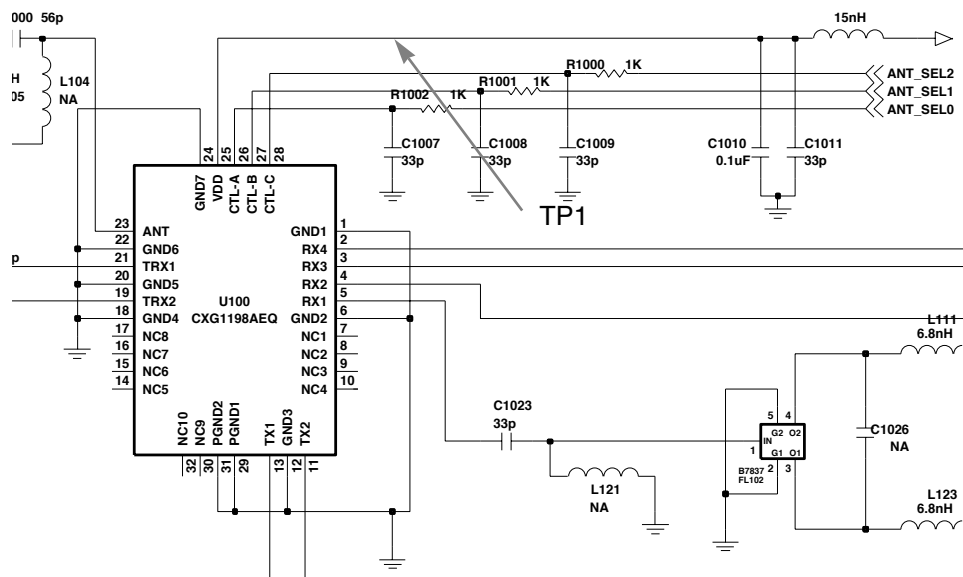
Schematic of the Antenna Switch Block

4. TROUBLE SHOOTING

ANTENNA SWITCH MODULE LOGIC

	IN_A	IN_B	IN_C
GSM900/GSM850 TX	HIGH	HIGH	LOW
DCS/PCS TX	HIGH	LOW	LOW
GSM 850 RX	LOW	HIGH	LOW
UMTS 850	HIGH	LOW	HIGH
DCS RX	LOW	HIGH	HIGH
PCS RX	LOW	LOW	HIGH
UMTS 1900	HIGH	HIGH	HIGH
GSM900 RX	LOW	LOW	LOW

Logic Table of the Antenna Switch

Checking Switch Block power source

```
┌─────────────────────────┐
│   Check Soldering of     │
│ ANT_SEL0, 1, 2 High Level│
└─────────────────────────┘
              │
              ▼
         ╱─────────╲              ┌──────────────────────────┐
        ╱ 2.5V <     ╲    NO      │      Check VCC           │
       ╱ Voltgae < 3.0V╲─────────▶│ TP1 VREG_RFRX_0_2.85V    │
        ╲             ╱           └──────────────────────────┘
         ╲─────────╱
              │ YES
              ▼
┌─────────────────────────┐
│    Check the Logic       │
│    in each mode          │
└─────────────────────────┘
```
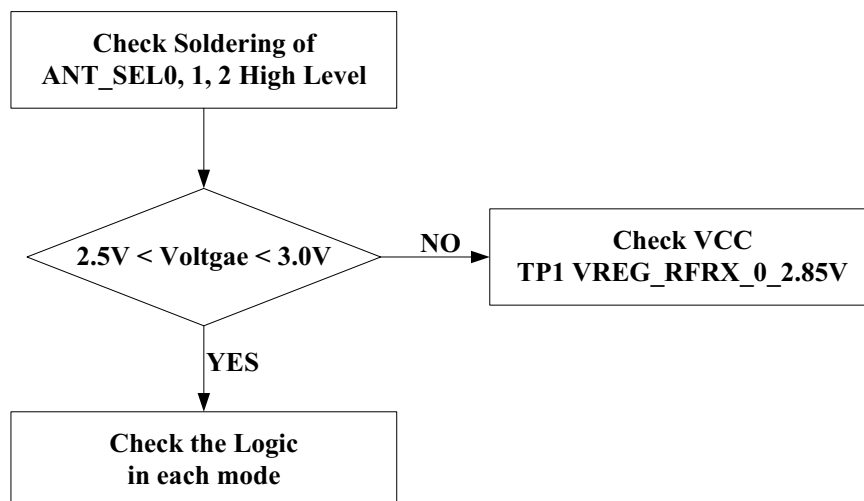
4.5. Checking UMTS Block

4.5.1. Checking TX POWER of UMTS 1900MHz
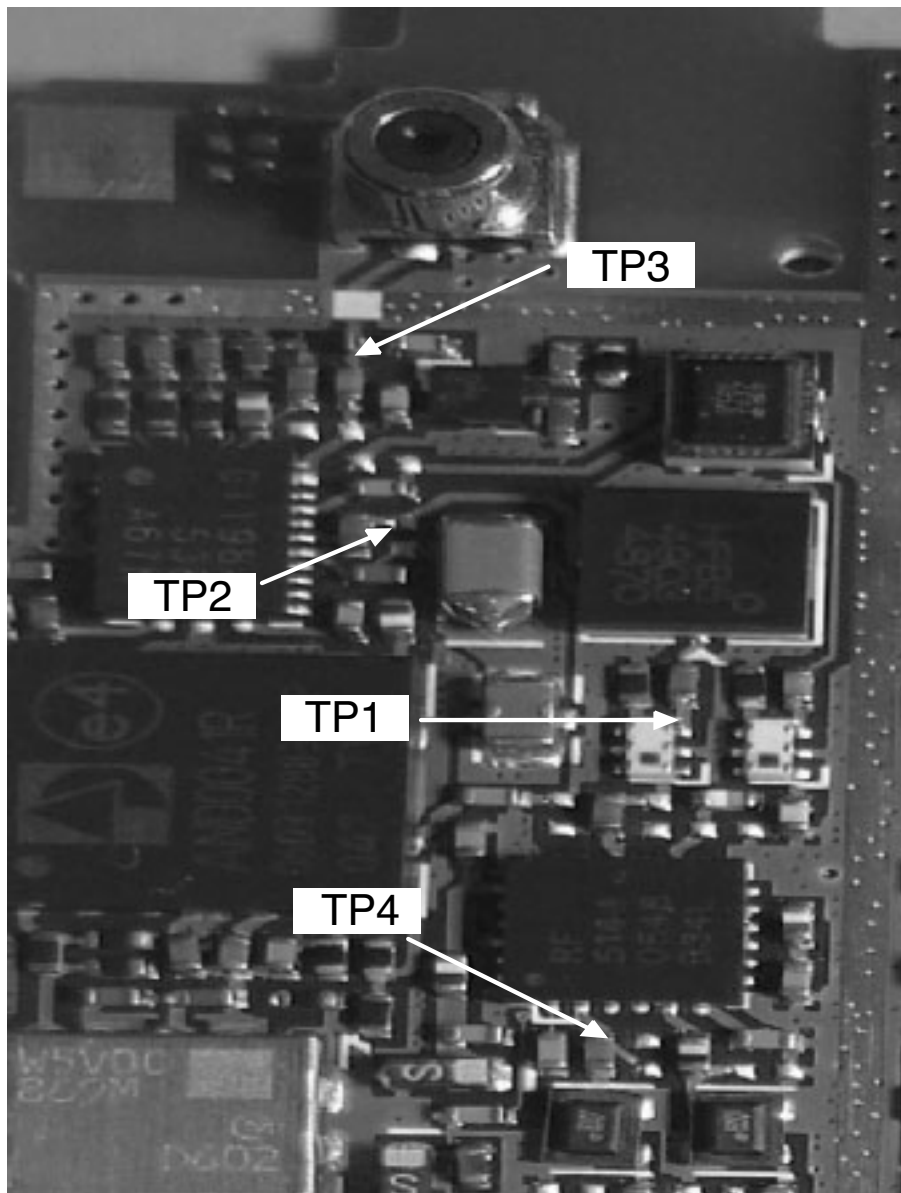
Test Point (RF TX POWER of UMTS1900)

For testing, Max power of UMTS 1900MHz is needed.

```
┌─────────────────────┐
│ Run a FTM program   │
│ set RF mode to      │
│ 1900B set uplink    │
│ fre to 9262 Click Tx│
│ On and WCDMA set    │
│ PA range R0 and R1  │
│ on set Tx AGC to 410│
└─────────┬───────────┘
          │
          ▼
    ╱─────────────╲          YES   ╱─────────────╲    NO   ┌─────────────┐
   ╱  Check a      ╲──────────────╱  Check TP1    ╲───────▶│ Check a     │
   ╲  current over ╱              ╲  over 25dBm?   ╱        │ Coupler U104│
    ╲  500mA?      ╱               ╲             ╱          │ and a soldig│
     ╲───────────╱                  ╲─────────╱            │ of C1072    │
          │ NO                           │ YES             └─────────────┘
          ▼                              ▼
    ╱─────────────╲   NO   ┌──────────┐  ╱─────────────╲   NO   ┌─────────────┐
   ╱  Check TP4    ╲──────▶│Check TxSAW│ ╱  Check TP2    ╲───────▶│ Check a     │
   ╲  over −5dBm?  ╱       │Filter and │ ╲  over 23dBm?  ╱        │ Duplexer and│
    ╲            ╱         │a soldig   │  ╲           ╱           │ a soldig of │
     ╲─────────╱          │of L401,C1099│  ╲───────╱             │ C1071       │
          │ YES          └──────────┘        │ YES              └─────────────┘
          ▼                                  ▼
   ┌──────────────┐                    ╱─────────────╲   NO   ┌─────────────┐
   │ Check PAM    │                   ╱  Check TP3    ╲───────▶│ Check       │
   │ block        │                   ╲  over 22dBm?  ╱        │ ANT,SW      │
   │ Refer to 3,5,4│                   ╲           ╱           │ Module U100 │
   └──────────────┘                     ╲───────╱             └─────────────┘
                                            │ YES
                                            ▼
                                     ┌─────────────┐
                                     │ Tx is OK    │
                                     │ Check other │
                                     │ parts       │
                                     └─────────────┘
```

4.5.2 Checking TX POWER of UMTS 850MHz
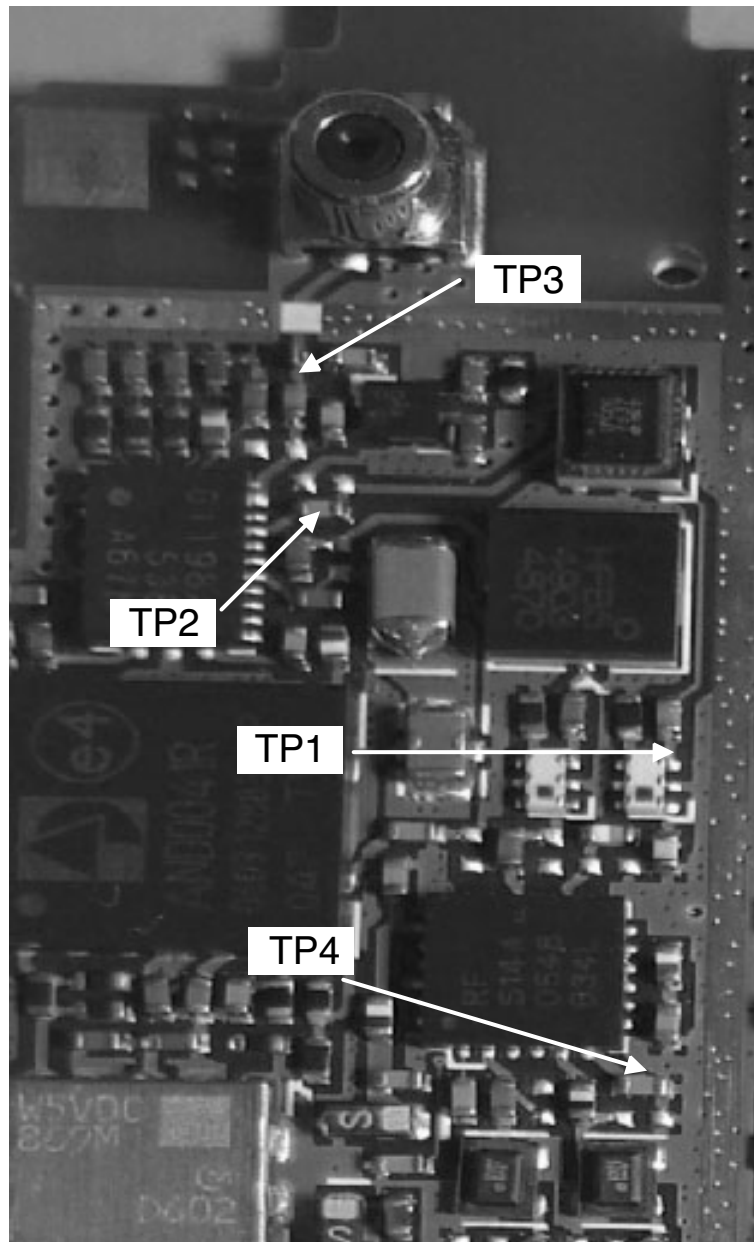
Test Point RF TX POWER of UMTS 850

4. TROUBLE SHOOTING

For testing, Max power of UMTS50NHz is needed.

```
┌─────────────────────┐
│ Run a FTM program   │
│ set RF mode to      │
│ 1900B set uplink    │
│ fre. to 4135 Click TX│
│ On and WCDMA set    │
│ PA range R0 and R1  │
│ on set Tx AGC to 430│
└─────────────────────┘
           │
           ▼
     ◇ Check a              YES      ◇ Check TP1        NO    ┌──────────────┐
       current over  ──────────────►   over 25dBm?  ────────►│ Check a      │
       500mA?                                                 │ Coupler U106 │
                                                              │ and a solding│
           │ NO                           │ YES               │ of L160      │
           ▼                              ▼                    └──────────────┘
┌──────────────┐  NO  ◇ Check TP4        ◇ Check TP2    NO    ┌──────────────┐
│ Check Tx SAW │◄─────  over -5dBm?        over 23dBm? ──────►│ Check a      │
│ Filter and a │                                              │ Duplexer and │
│ solding      │           │                  │ YES           │ a solding of │
│ of C1105     │           ▼                  ▼               │ C1075        │
└──────────────┘  ┌──────────────┐    ◇ Check TP3     NO     └──────────────┘
                  │ Check PAM block│      over 22dBm? ──────► ┌──────────────┐
                  │ Refer to 3.5.4 │                          │ Check        │
                  └──────────────┘          │ YES             │ ANT.SW       │
                                            ▼                  │ Module U100  │
                                   ┌──────────────┐            └──────────────┘
                                   │ Tx is OK     │
                                   │ Check ohter  │
                                   │ parts        │
                                   └──────────────┘
```

4. 5. 3 Checking UMTS PAM Control Block

· PAM control signal
 1. HDET_EN : UMTS Tx Power Detect IC(U1014:HDET) Enable
 2. TX_AGC_ADJ : UMTS RTR6250 Tx Amp Gain Control
 3. VREG : UMTS PAM enable
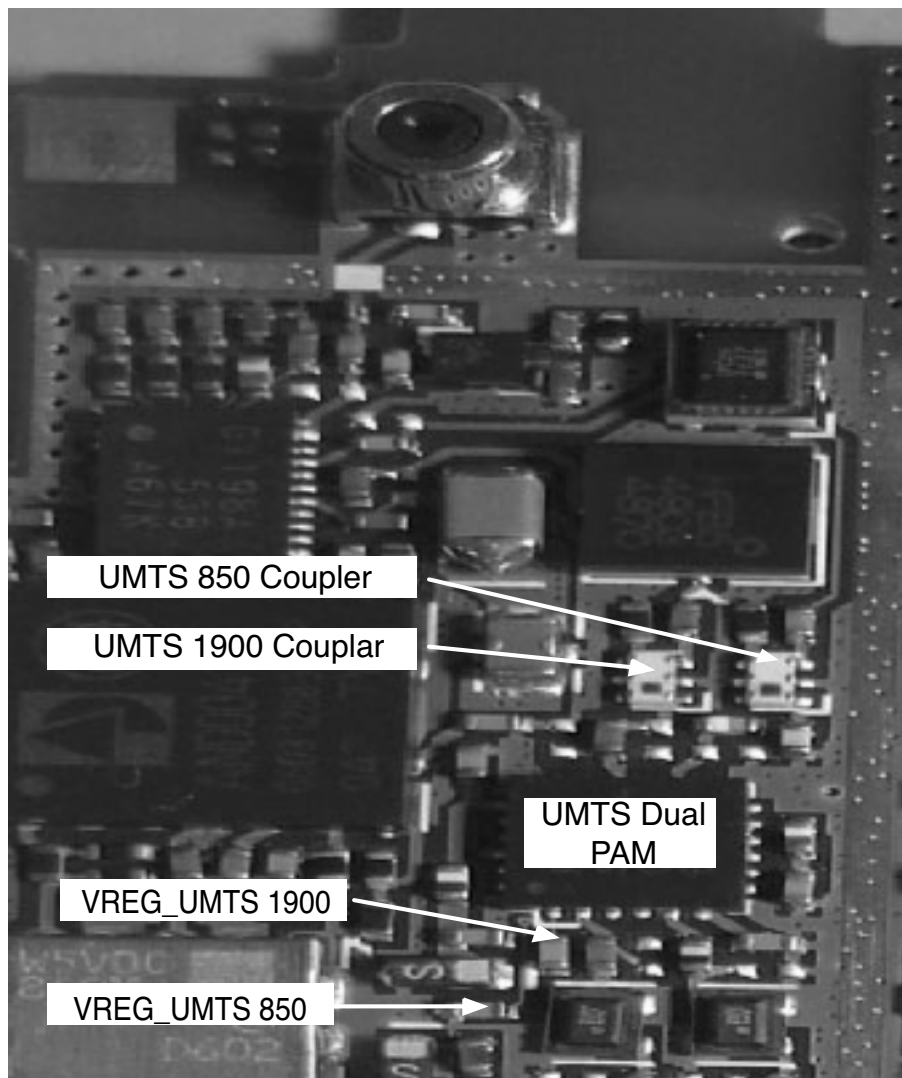
→ 62HDET_EN must be high (over 2.75V)
 → VREF must be high (over 2.85V)

4. 5. 4 Check RF Rx Level

Set the Phone Rx is ON

Check bias1/ bias1' Over 2V? —No→ Check vias block solding

Yes

Check TP1 Signal exist? —No→ Check ANT100

Check TP2/TP2' Signal exist? —No→ Check ANT. SW Module U100

Check TP3/TP3' Signal exist? —No→ Check Duplxer FL106/FL107

Check TP4/TP4' Signal exist? —No→ Check RFL6202 and FL109/FL110

Rx is OK Check other Parts
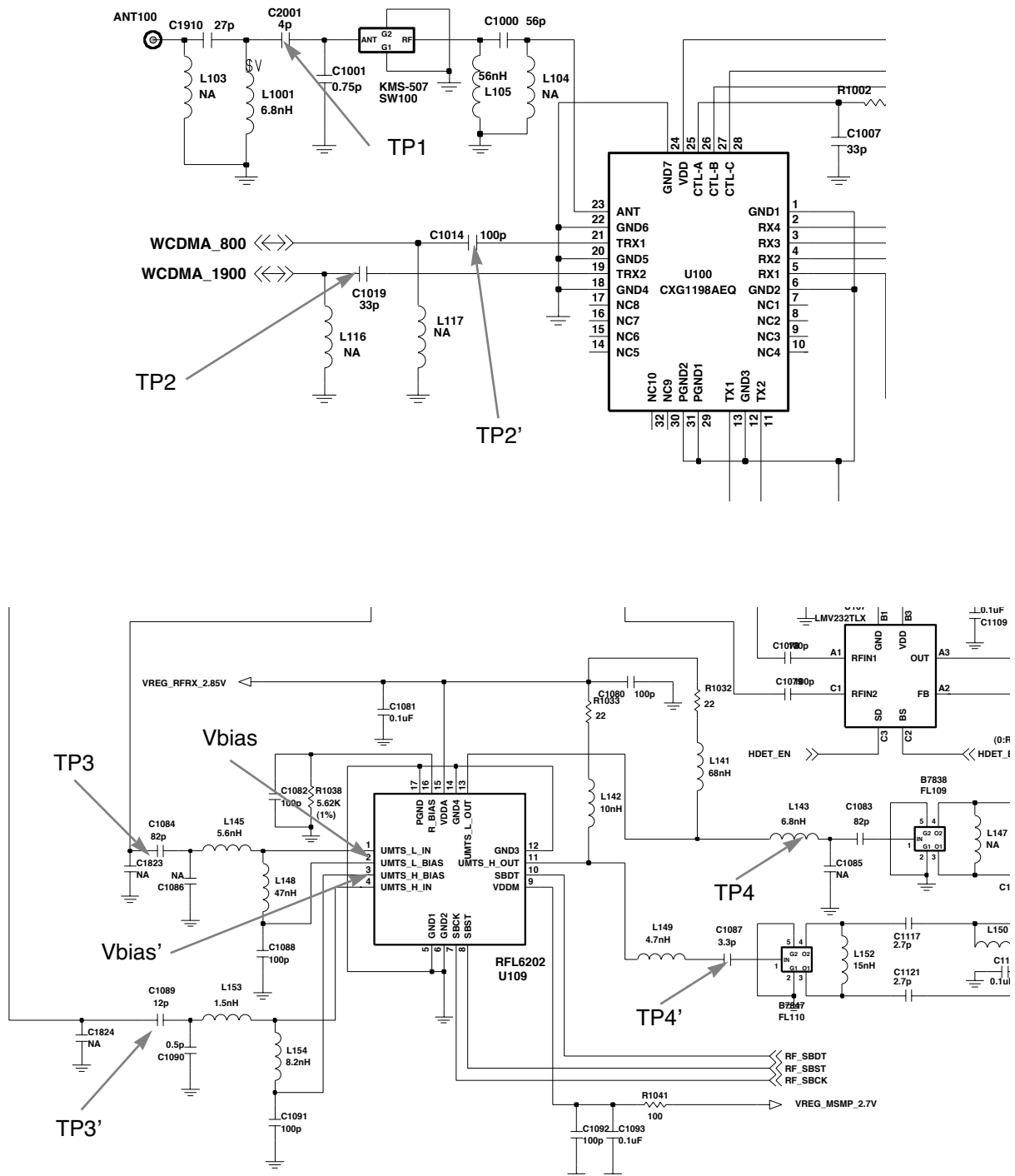
TP* ; UMTS 850 RX PATH
TP*'; UMTS 1900 RX PATH

4.6. Checking GSM Block


```
          ┌─────────────┐
          │    START    │
          └──────┬──────┘
                 │
                 ▼
          ◇ 1. Check TXVCO Block ◇
                 │
                 ▼
          ◇ 2. Check ANT. SW
               Module ◇
                 │
                 ▼
          ◇ 3. Check Tx PAM Block ◇
                 │
                 ▼
          ◇ 4. Check RF Rx Level ◇
                 │
                 ▼
          ┌─────────────────┐
          │ 5. Re-download SW │
          │     & CAL.        │
          └─────────────────┘
```
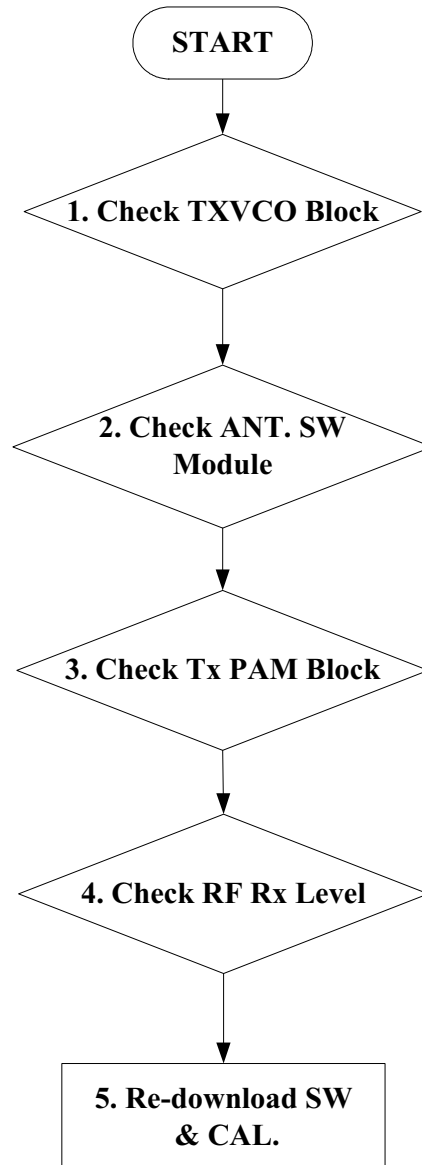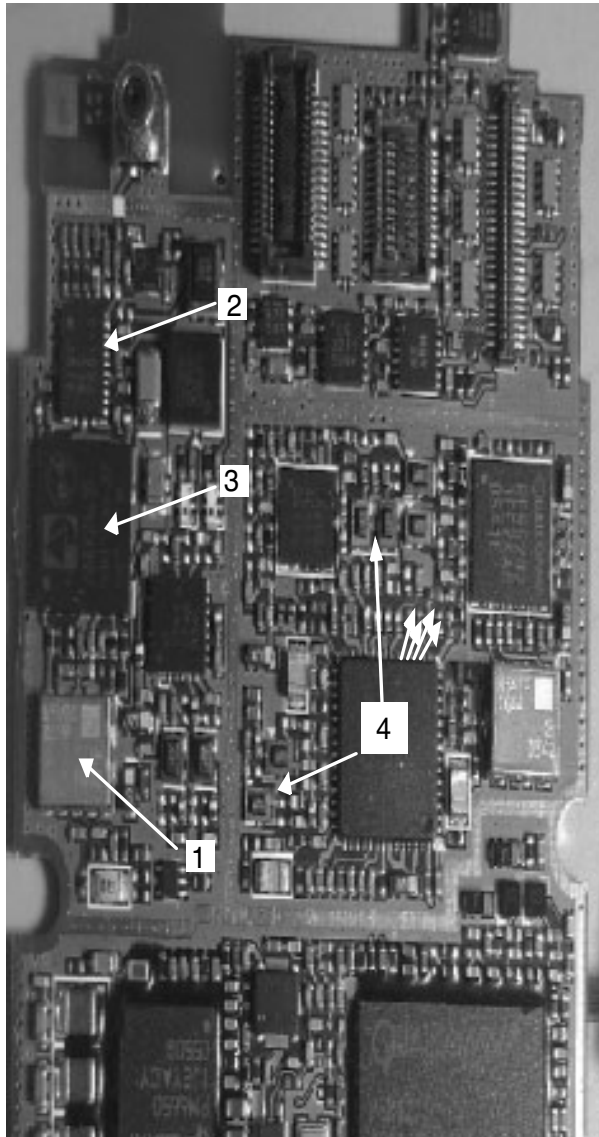
4.6.1 Checking VCO Block
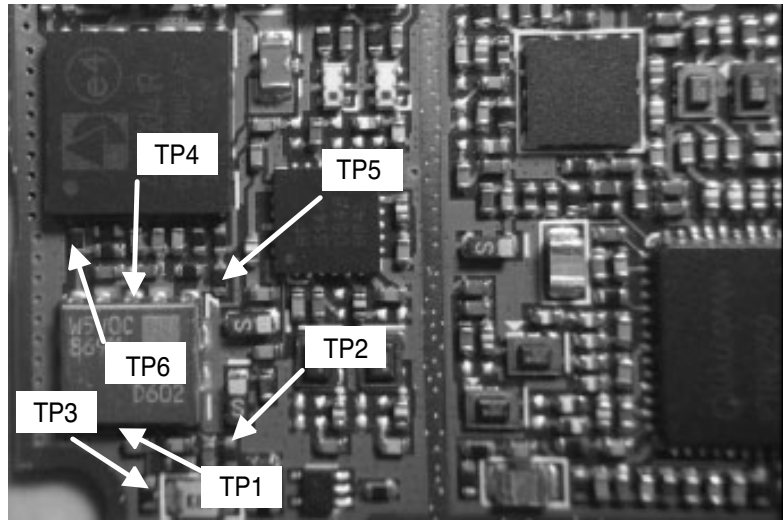
Test Point(TXVCO Level)

Schematic of RF TXVCO

TX VCO CONTROL LOGIC		
	SW2	SW1
GSM850/900	HIGH	LOW
DCS1800/PCS1900	LOW	HIGH
NO OSCILLATION	HIGH	HIGH

4. TROUBLE SHOOTING

```
                    ┌──────────────────┐
                    │      START       │
                    └──────────────────┘
                             │
                             ▼
                         ╱───────╲
                        ╱ Check TP1 ╲        NO      ┌──────────────┐
                       ╱ 0.5V<TP1<2.5V╲─────────────▶│    Check     │
                        ╲           ╱               │   RTR6250    │
                         ╲─────────╱                └──────────────┘
                             │                             │
                            YES                            │
                             ▼                             ▼
                         ╱──────────────╲          ┌──────────────┐
                        ╱ Check TP2,TP3  ╲   NO    │Check Soldering│
                       ╱  If GSM TP2=High, ╲──────▶│  & MSM6275    │
                       ╲ TP3=Low If DCS/PCS╱       └──────────────┘
                        ╲TP2=Low, TP3=High╱               │
                         ╲──────────────╱                 │
                             │                             ▼
                            YES                    ┌──────────────┐
                             ▼                     │    Check     │
                         ╱───────────╲     NO      │  PMIC(U400)  │
                        ╱  Check TP4   ╲──────────▶└──────────────┘
                       ╱ 2.8V<TP4<3.0V  ╲                 │
                        ╲             ╱                   │
                         ╲───────────╱                    ▼
                             │                    ┌──────────────┐
                            YES                   │Check Soldering│
                             ▼                    │of TXVCO(X101) │
                         ╱──────────────╲   NO    └──────────────┘
                        ╱ Check TP5, TP6  ╲──────────▶
                       ╱0dBm<TP5,TP6<5dBm  ╲
                        ╲               ╱
                         ╲─────────────╱
                             │
                            YES
                             ▼
                    ┌──────────────────┐
                    │ TX VCO(X101)is OK │
                    │  Check Other parts│
                    └──────────────────┘
```
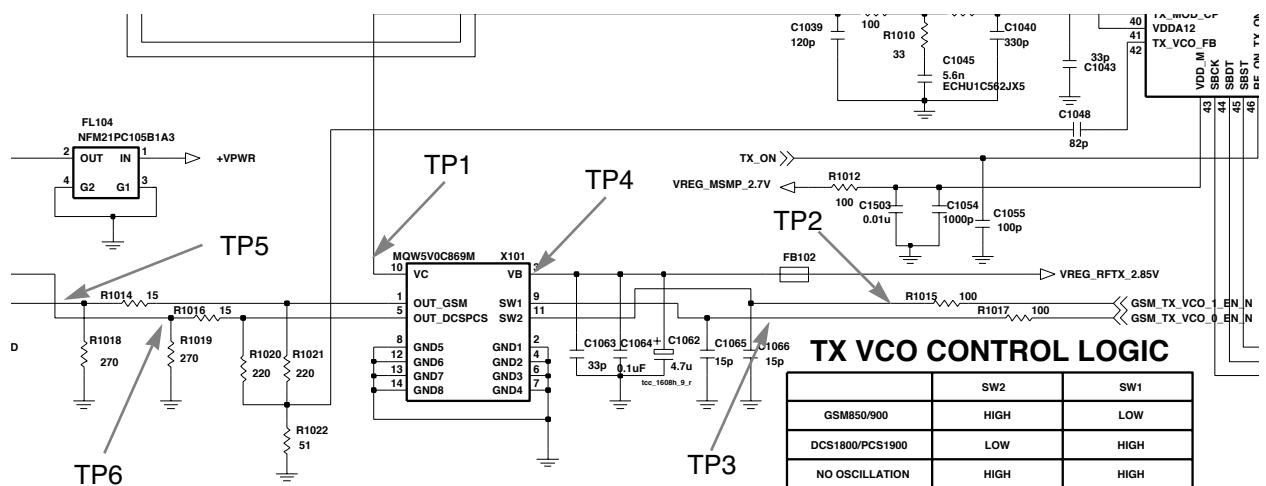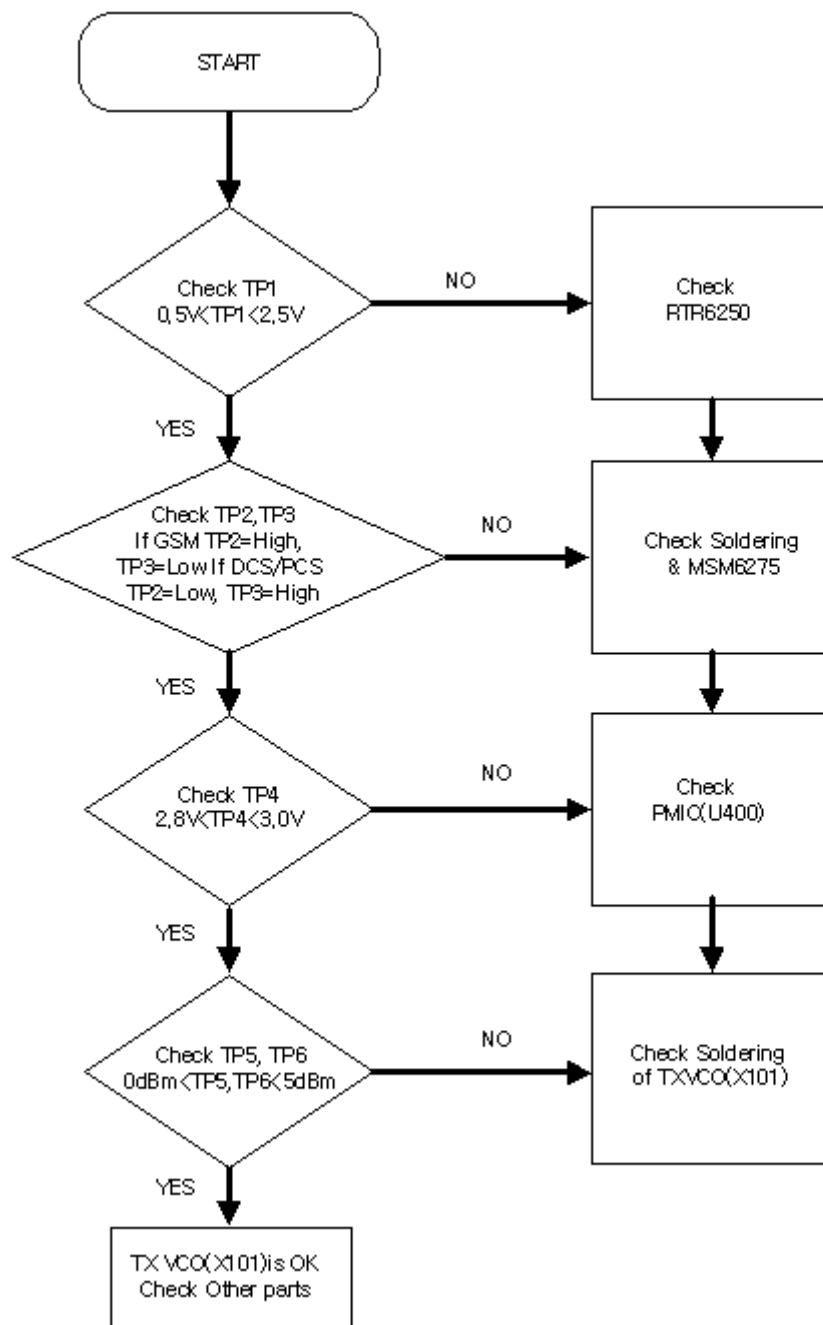
4.6.2 Checking Ant. SW Module

Refer to chapter 4.4

4.6.3 Checking RF Tx level

ANTENNA SWITCH MODULE LOGIC

	IN_A	IN_B	IN_C
GSM900/GSM850 TX	HIGH	HIGH	LOW
DCS/PCS TX	HIGH	LOW	LOW
GSM 850 RX	LOW	HIGH	LOW
UMTS 850	HIGH	LOW	HIGH
DCS RX	HIGH	LOW	HIGH
PCS RX	LOW	LOW	HIGH
UMTS 1900	HIGH	HIGH	HIGH
GSM900 RX	LOW	LOW	LOW

GSM/EDGE

Schematic of RF TX Level

4. TROUBLE SHOOTING

```
                           ┌─────────────────┐
                           │      START      │
                           └────────┬────────┘
                                    │
                                    ▼
                    ╱─────────────────────────╲
                   ╱      Check TP1             ╲        YES      ┌──────────────┐
                  ╱  If GSM850/GSM900 over 31dBm? ╲──────────────▶│    Check     │
                  ╲  If PCS/DCS over 29dBm?      ╱                │   RTR6250    │
                   ╲                           ╱                  └──────┬───────┘
                    ╲─────────────────────────╱                         │
                                │ NO                                     │
                                ▼                                        ▼
                    ╱─────────────────────────╲               ┌──────────────┐
                   ╱      Check TP2, TP3        ╲       YES     │Check Soldering│
                  ╱   If TP2 over 29dBm?         ╲─────────────▶│  & MSM6275   │
                  ╲   If TP3 over 29dBm?         ╱              └──────┬───────┘
                   ╲                           ╱                       │
                    ╲─────────────────────────╱                        │
                                │ NO                                    ▼
                                ▼                               ┌──────────────┐
                    ╱─────────────────────────╲       YES      │    Check     │
                   ╱   Check PAM Block OK?      ╲──────────────▶│ PMIC(U400)   │
                  ╱   Refer to chapter 3.6.4    ╱               └──────────────┘
                   ╲                           ╱
                    ╲─────────────────────────╱
                                │ NO
                                ▼
                    ┌─────────────────────────┐
                    │  Check Soldering of PAM  │
                    │        Block             │
                    │  If problems still exit, │
                    │    replace the PAM       │
                    └────────────┬─────────────┘
                                 │ NO
                                 ▼
                    ╱─────────────────────────╲       YES      ┌──────────────┐
                   ╱    Problems resolved?      ╲──────────────▶│GSM850/GSM900/│
                   ╲                           ╱                │   DCS/PCS    │
                    ╲─────────────────────────╱                │   TX is OK   │
                                │ NO                            └──────────────┘
                                ▼
                    ┌─────────────────────────┐
                    │    Change the Board      │
                    └─────────────────────────┘
```

4.6.4 Checking PAM Block

PAM Control Signal

TP1. GSM_PA_RAMP : Power Amp Gain Control. typically, 0.5V < Vapc < 1.6V, TP2. GSM_PA_EN :
  Power Amp Enable
  (Power ON : higher than 2.5V , Power OFF : lower than 0.7V)
TP3. GSM_PA_BAND : Power Amp Band Selection Control
  (GSM Mode : lower than 0.7V , DCS/PCS Mode : higher than 2.5V)
TP4. +VPWR : PAM Supply Voltage Vcc higher than 3.5V
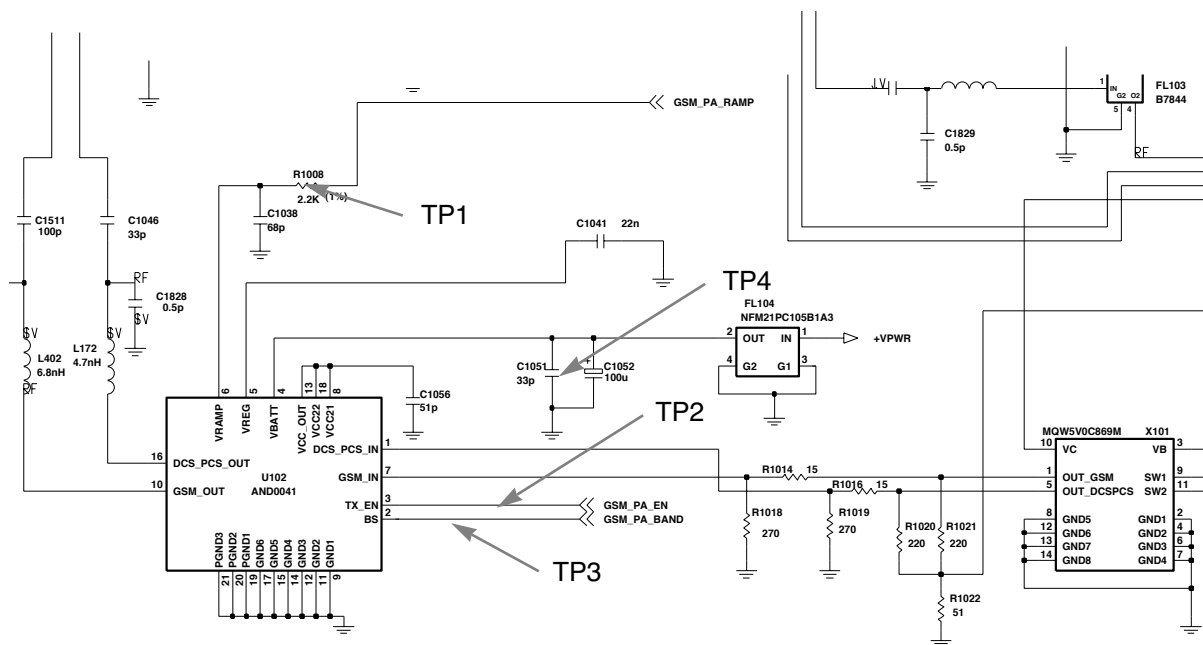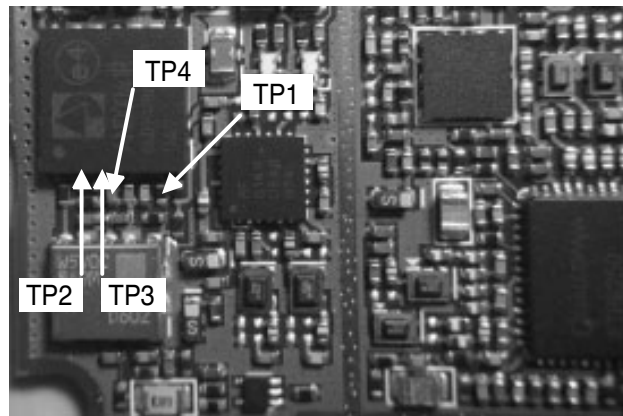
Schematic of PAM block

4. TROUBLE SHOOTING

4.6.5 Checking RF Rx Block

TP1. GSM850 Rx SAW Input
TP2. DCS Rx SAW Input
TP3. PCS Rx SAW Input
TP4. GSM900 Rx SAW Input
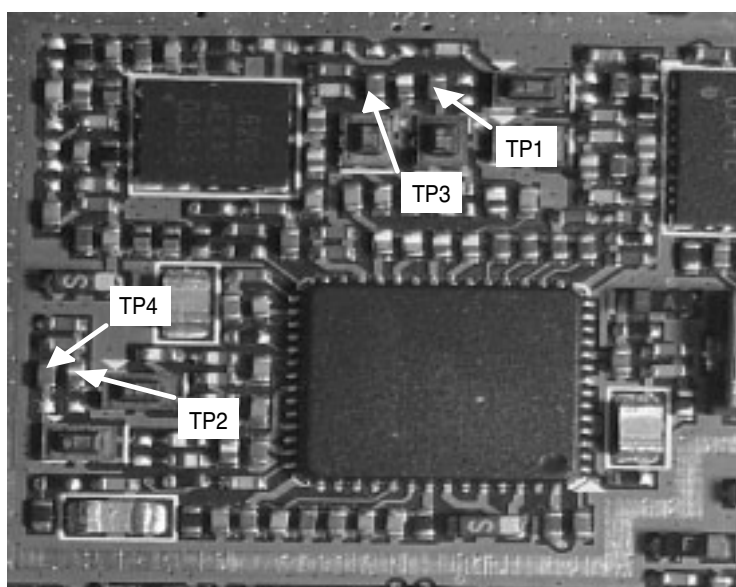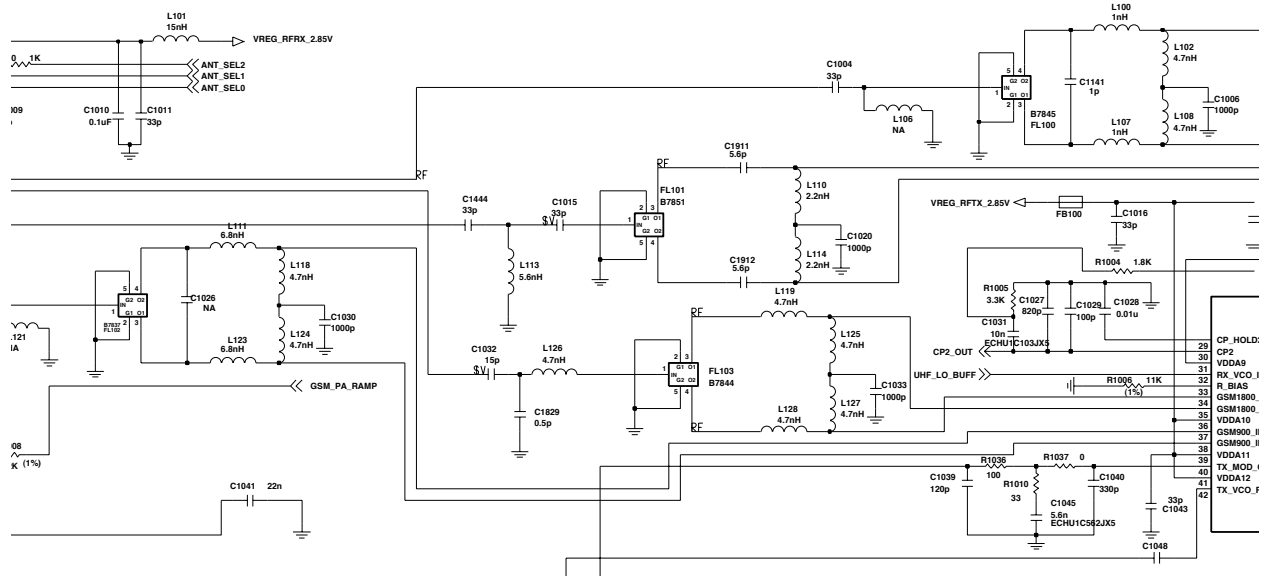
Schematic of GSM850/GSM900/DCS/PCS Rx Block

4. TROUBLE SHOOTING

Flowchart:

START
↓
TP1, TP2, TP3, TP4 Signals exits? — NO → Check ANT, SW Module(U100) and soldering of TPs
↓ YES
Rx still has problems? — NO → GSM850/GSM900/DCS/PCS Rx is OK
↓ YES
Re-download & Calibration
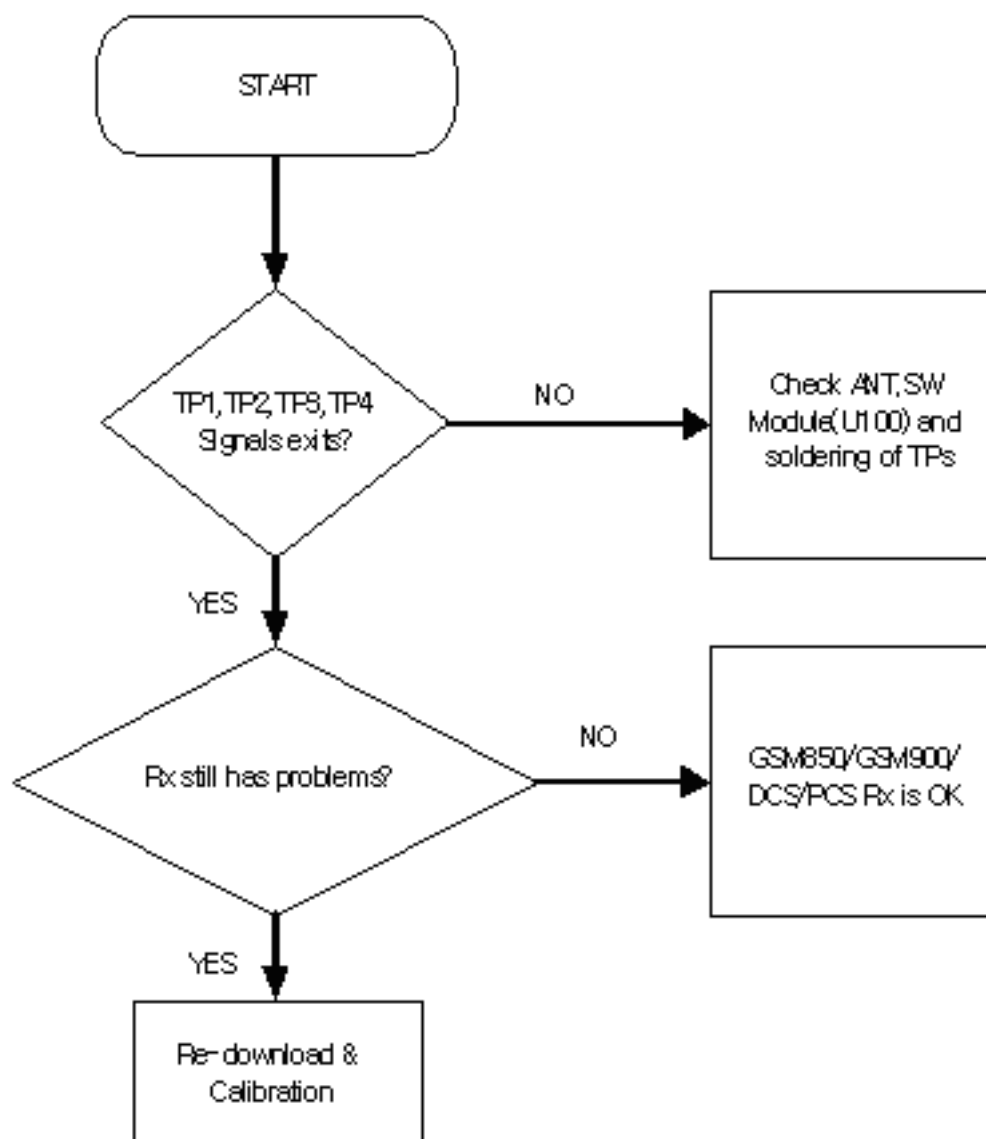
4.7 Power ON Troubleshooting

Power On sequence of CU500 is :
PWR key press(Key PCB) → KEY_ON_SW_N go to low(D508),PM6650 KPDPWR_N pin(24) →
PM6650 Power Up → VREG_MSMC_1.25V(C436), VREG_MSME_1.8V(C434),
VREG_MSMP_2.7V(C425), VREG_MSMA_2.6V(C423), VREG_TCXO_2.85V(C413) power up
and system reset assert to MSM → Phone booting and PS_HOLD(D505) assert to PMIC

```
                    ┌──────────┐
                    │  Start   │
                    └────┬─────┘
                         ↓
        Battery voltg. higher ──NO──> Change or charging the
             than 3.35V?                     Battery
                 │YES
                 ↓
        D701 high to low ──NO──> Check the Key Dome
        when key press?
                 │YES
                 ↓
    VREG_MSMC_1.375V,VREG_MSMP_2.7
    V,VREG_MSME_1.8V,           ──NO──> Change the Main board
    VREG_TCXO_2.85V,
    VREG_MSMA_2.6V
    power up?
                 │YES
                 ↓
        Is clock ok?
        C1133 : 19.2M    ──NO──> Check the TXCO
        X400(pin1,4) : 32.768Khz
                 │YES
                 ↓
        Change the Main board
```

4. TROUBLE SHOOTING

D701

VREG_TCXO

C1133 : 48Mhz

VREG_MSMC

VREG_MSME

VREG_MSMA

X400 : 32.768Mhz

VREG_MSMP

4.8 Charger Troubleshooting

Charging Current Flow

Pass Tr (ON)

TA (4.6V)

6 5 4   Q400 QST4

1 2 3

CHG_CNT_N

smd_2125h_65_r

ICHARGE

R300 0.1

Route as equal length as possible !! --> ICHARGE , ICHARGEOUT

ICHARGEOUT

+VPWR

Q401 SI3493DV-E3

Main Battery

4.2~4.25V

Battery FET (ON)
BATT_FET_N

R301 100K

Battery charging circuit !!!!!

Charging Procedure
- Connect TA
- Control the charging current by PM6650 IC
- Charging current flows into the battery

Troubleshooting Setup
- Connect TA and battery to the phone

Check Point
- Connection of TA
- Charging current path
- Battery

Troubleshooting Procedure
- Check the charger connector
- Check the charging current Path
- Check the battery

R300

Q401

Q400

Troubleshooting Flow

```
                        ┌─────────────┐
                        │    Start    │
                        └─────────────┘
                               │
                               ▼
                    ┌───────────────────────┐
                    │ Check the pin and battery
                    │ Connect terminals of I/O
                    │ connector              │
                    └───────────────────────┘
                               │
                               ▼
                          ╱─────────╲          NO    ┌──────────────────────┐
                         ╱ Connection ╲──────────────▶│ Change I/O connector │
                         ╲    OK?     ╱               └──────────────────────┘
                          ╲─────────╱
                               │ Yes
                               ▼
                          ╱─────────╲          NO    ┌──────────────────────┐
                         ╱ Is the TA  ╲──────────────▶│      Change TA       │
                         ╲ voltage 4.6V?╱             └──────────────────────┘
                          ╲─────────╱
                               │ Yes
                               ▼
                          ╱─────────╲         Yes    ┌──────────────────────┐
                         ╱ Is it charging ╲──────────▶│        END           │
                         ╲ properly       ╱          └──────────────────────┘
                         ╱ After turning on╲
                         ╲ Q400, Q401?    ╱
                          ╲─────────╱
                               │ NO
                               ▼
                    ┌───────────────────────┐
                    │   Change the board    │
                    └───────────────────────┘
```
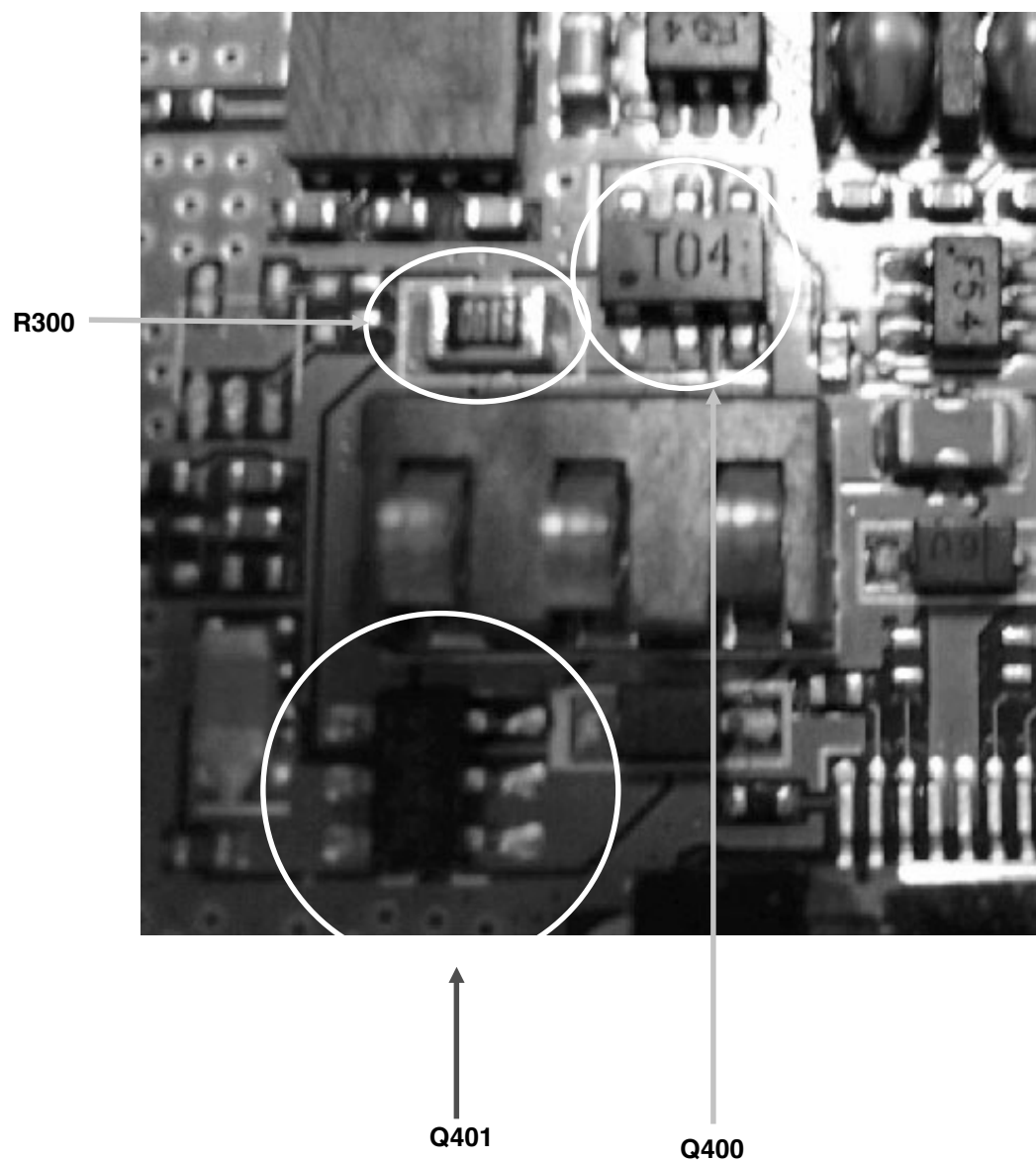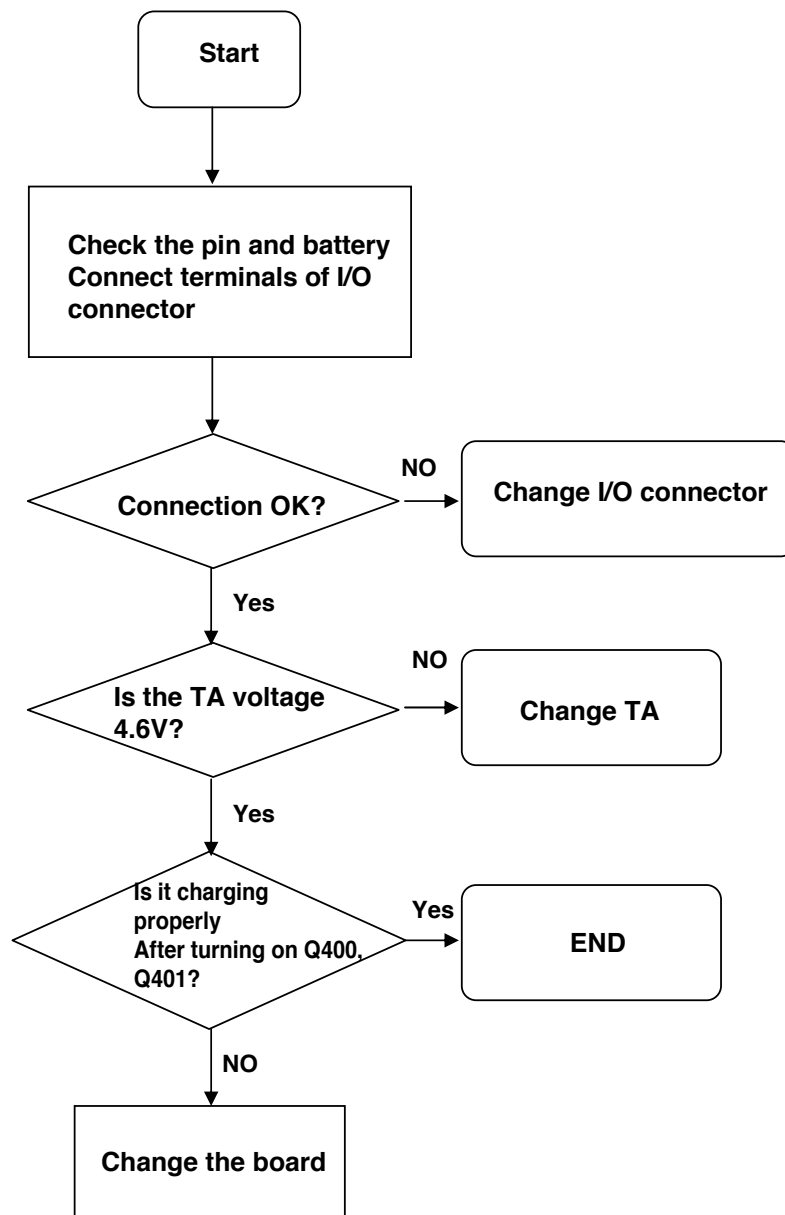
4.9 USB Troubleshooting

USB Initial sequence of CU500 is :
USB connected to CU500 power on → USB_VBUS(Q501) go to 5V → USB_D+ go to 3.3V
48M Crystal on → USB_VP and USB_VN is triggered → USB work.

```
                    ┌─────────────┐
                    │    Start    │
                    └─────────────┘
                          │
                          ▼
                    ◇ Power is on? ◇ ──NO──▶ Go to power on trouble shooting
                          │ YES
                          ▼
                    ◇ Cable is inserted? ◇ ──NO──▶ Insert cable
                          │ YES
                          ▼
                    ◇ Q501 3 pin is 5V? ◇ ──NO──▶ Check Q501
                          │ YES
                          ▼
                    ◇ USB_D+ is 3.3V? ◇ ──NO──▶ Check U505
                          │ YES
                          ▼
                    ◇ 48M clock is running? ◇ ──NO──▶ Check X200
                          │ YES
                          ▼
                    Change the Main board
```
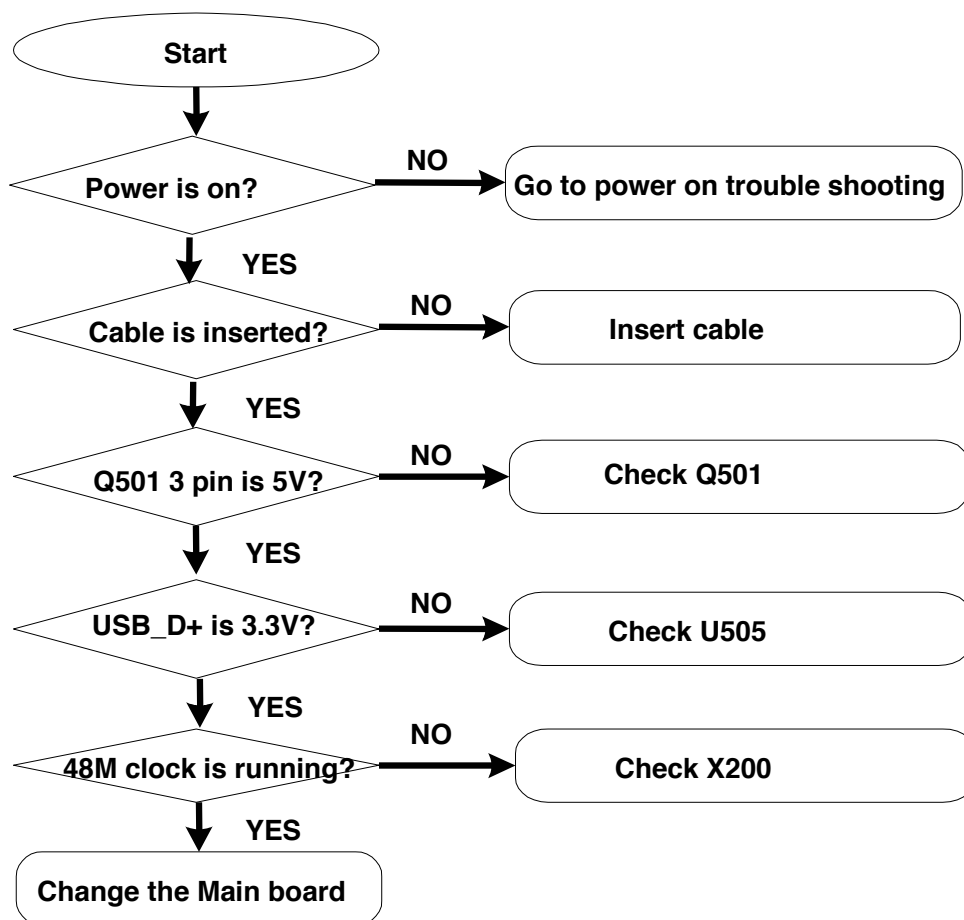
Q501
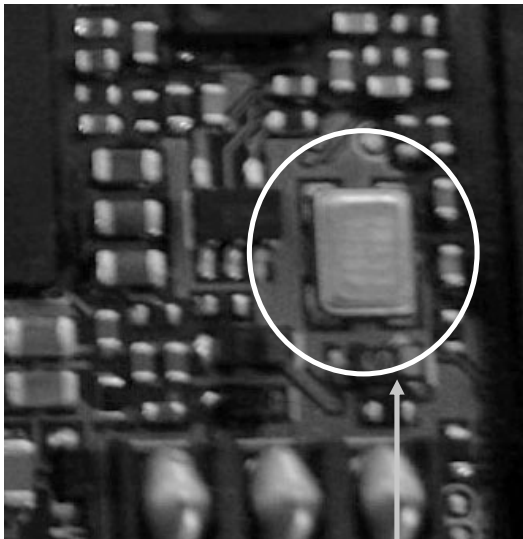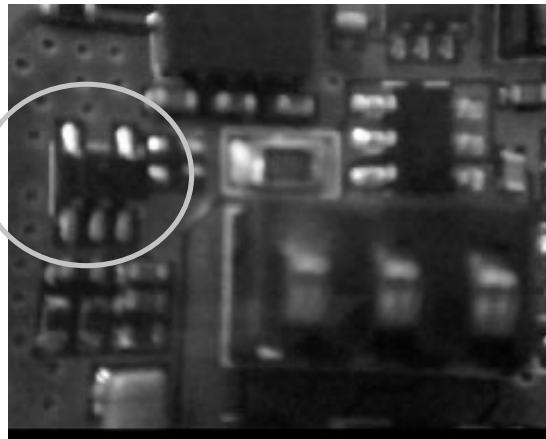
X 200
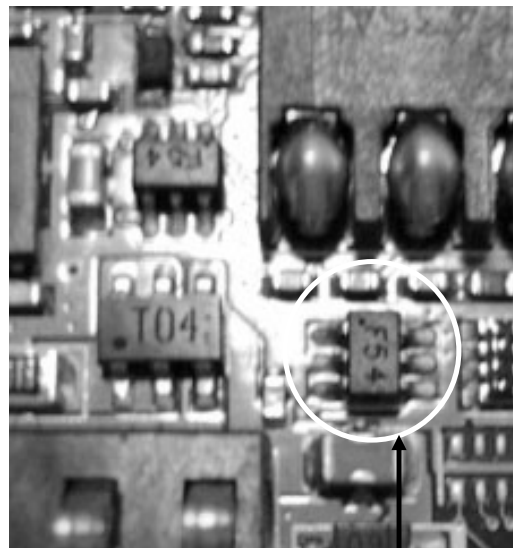
U505

4.10 SIM Detect Troubleshooting

USIM Initial sequence of CU500 is :
USIM_CLK,USIM_RST,USIM_DATA triggered → VREG_UIM_2.85V go to 3.0V → USIM IF work

```
                    ┌─────────────┐
                    │    Start    │
                    └──────┬──────┘
                           ▼
                  ┌──────────────────┐
                  │ Re-insert the SIM │
                  │      card         │
                  └────────┬─────────┘
                           ▼
                     ╱ Work well? ╲ ──Yes──▶ ┌──────────┐
                     ╲           ╱           │   End    │
                           │ No              └──────────┘
                           ▼
            ╱ VREG_UIM_2.85V is 3.0V? ╲ ──NO──▶ ┌──────────────┐
            ╲ USIM_P_CLK is run?      ╱         │ Check CON500 │
                           │ YES                └──────────────┘
                           ▼
                  ┌──────────────────┐
                  │  Change SIM card │
                  └────────┬─────────┘
                           ▼
                     ╱ Work well? ╲ ──Yes──▶ ┌──────────┐
                     ╲           ╱           │   End    │
                           │ No              └──────────┘
                           ▼
                  ┌──────────────────┐
                  │ Change the Main  │
                  │     board        │
                  └──────────────────┘
```


USIM_P_DATA ← ● ● ● → Ground

USIM_P_CLK

USIM_P_RST_N

VREG_UIM_2.85
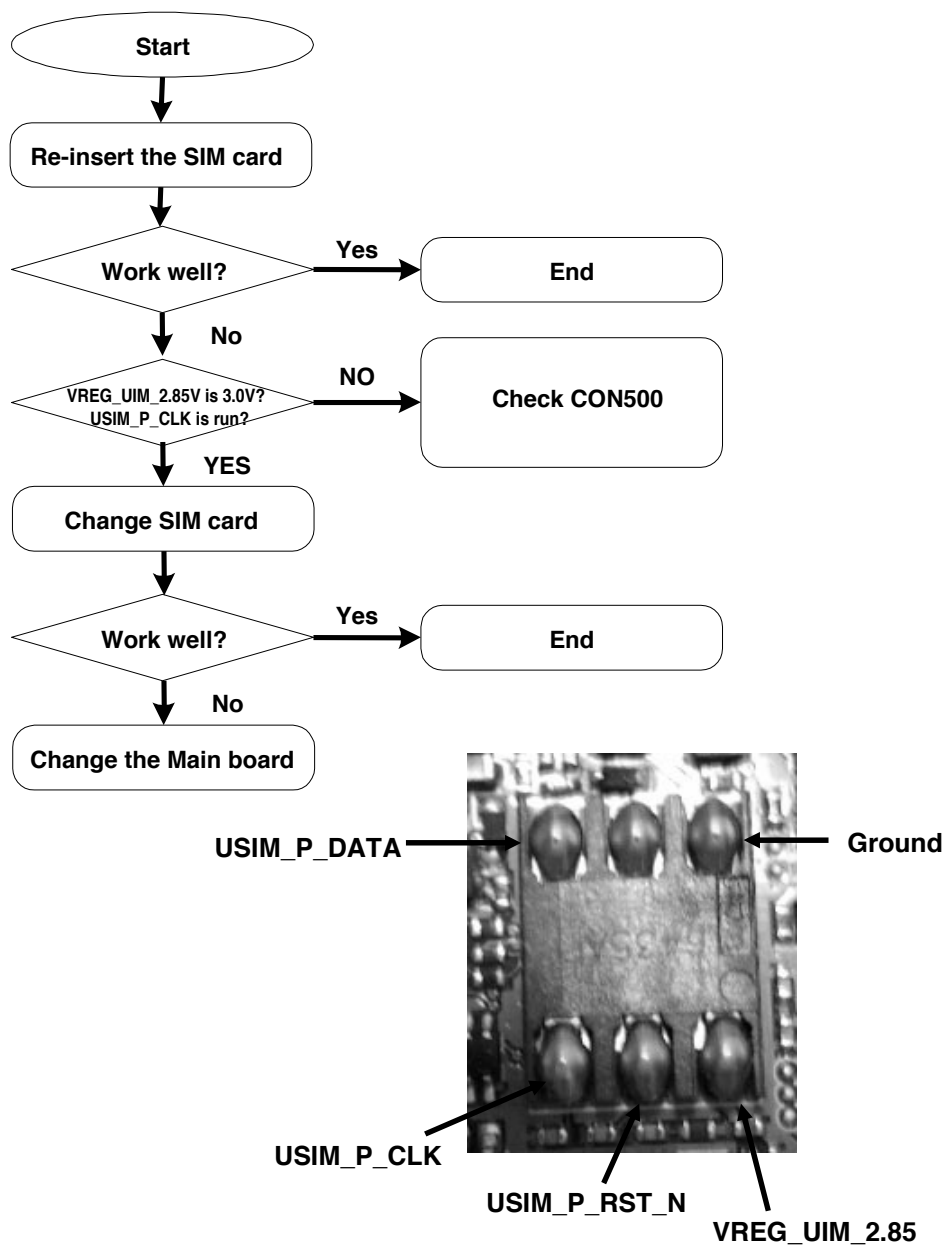
4.11 Camera Troubleshooting

Camera control signals are generated by MSM6275.

```
                    ┌──────────────────┐
                    │      Start       │
                    └──────────────────┘
                             │
                             ▼
              ┌──────────────────────────────┐
              │ Check the camera connector and │
              │    reconnect the camera       │
              └──────────────────────────────┘
                             │
                             ▼                 Yes
                    ◇ Camera is OK? ◇ ───────────────▶ ┌──────────┐
                             │                          │   END    │
                             │ NO                       └──────────┘
                             ▼
              ◇ VREG_CAM_2.7V         ◇       NO
                is 2.7V?(C413)          ───────────────▶ ┌───────────────────┐
                VREG_CAM_1.8V                             │ Change the Main board │
                is 1.8V?(R480)                            └───────────────────┘
                             │
                             │ Yes
                             ▼
              ◇ Check the CAM_MCLK ◇          NO
                   (FB602)             ───────────────▶ ┌───────────────────┐
                             │                          │ Change the Main board │
                             │ Yes                      └───────────────────┘
                             ▼
              ┌──────────────────────┐
              │  Change the camera   │
              └──────────────────────┘
                             │
                             ▼                 Yes
                    ◇ Camera is OK ◇  ───────────────▶ ┌──────────┐
                             │                          │   END    │
                             │ NO                       └──────────┘
                             ▼
              ┌──────────────────────┐
              │ Change the Main board │
              └──────────────────────┘
```


FB602

C413

R480
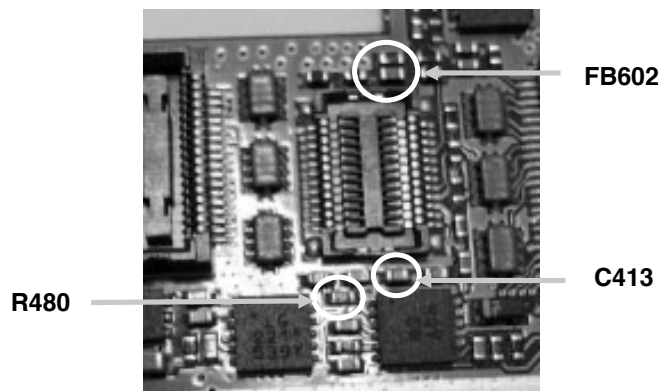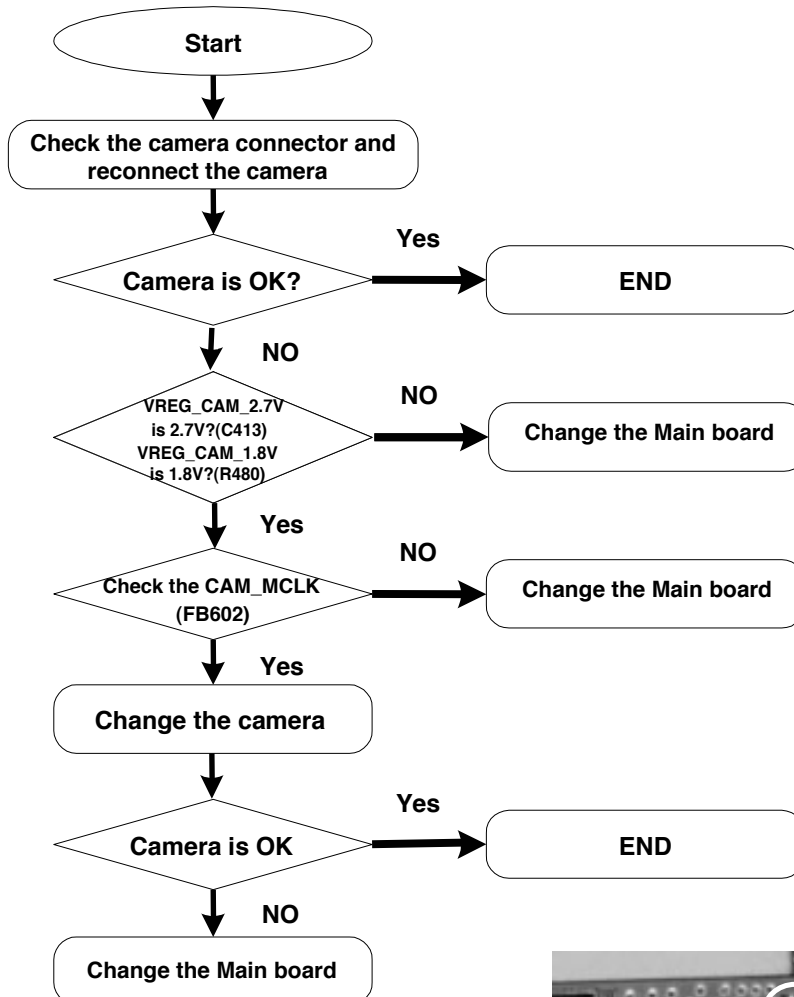
4.12 Keypad Backlight Troubleshooting

Key Pad Back Light is on as below :
Key pressing → KYBD_BACKLIGHT go to 0V → Main LED On

4.13 Folder ON/OFF Troubleshooting

Folder On/Off is worked as below :
Folder On/Off Event -> Flip(U500 pin 1) is triggered(On : about 2.1V, Off : 0V) ->
MSM6275 Sense the Folder Event

magnet

U504 pin 1
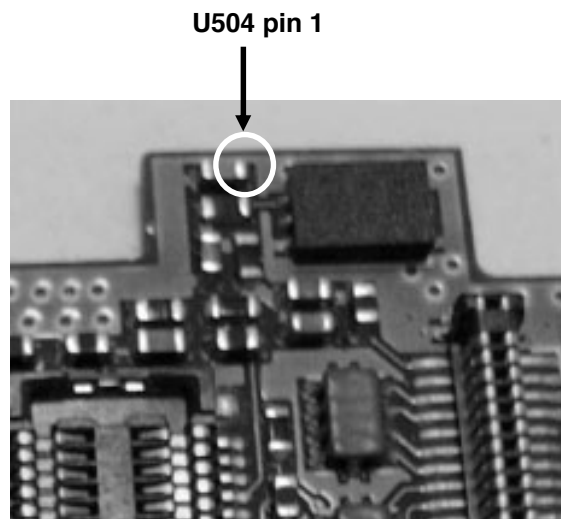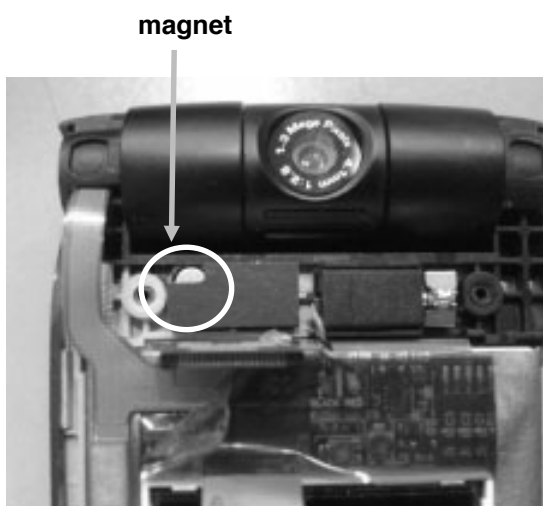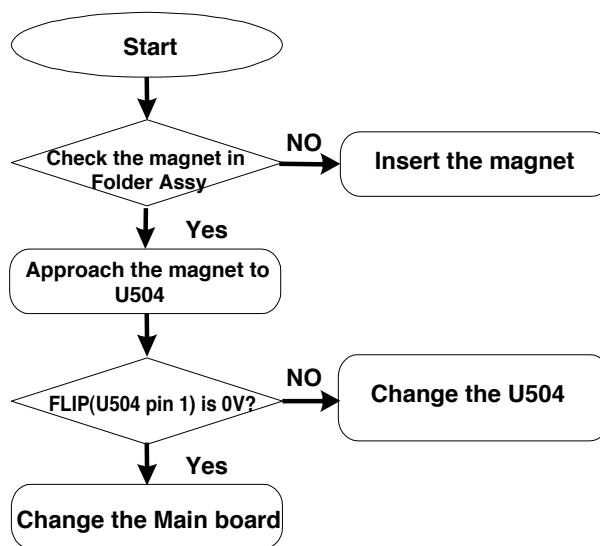
4.14 Main LCD Troubleshooting

Main LCD control signals are generated by MSM6275. The signal path is :
MSM6275→ C0N602 → CN2 → LCD Module

```
                    ┌─────────────┐
                    │    Start     │
                    └──────┬──────┘
                           │
                    ┌──────▼──────┐
                    │ Press END key │
                    └──────┬──────┘
                           │
                      ◇─────────◇        NO    ┌────────────────────────────┐
                   Key LED is on? ──────────────▶│ GO to power on trouble shooting │
                      ◇─────────◇              └────────────────────────────┘
                           │ Yes
                    ┌──────▼──────────┐
                    │ Disconnect and reconnect │
                    │ The LCD connector(CN602) │
                    └──────┬──────────┘
                           │
                      ◇─────────◇     Yes    ┌──────────┐
                   LCD display OK? ───────────▶│   END    │
                      ◇─────────◇            └──────────┘
                           │ No
                    ┌──────▼──────────┐
                    │ Change the LCD module │
                    └──────┬──────────┘
                           │
                      ◇─────────◇     Yes    ┌──────────┐
                   LCD display OK? ───────────▶│   END    │
                      ◇─────────◇            └──────────┘
                           │ No
                    ┌──────▼──────────┐
                    │ Change the Main board │
                    └──────┬──────────┘
                           │
                      ◇─────────◇     Yes    ┌──────────┐
                   LCD display OK? ───────────▶│   END    │
                      ◇─────────◇            └──────────┘
                           │ No
                    ┌──────▼──────────┐
                    │ Change the LCD FPCB │
                    └─────────────────┘
```
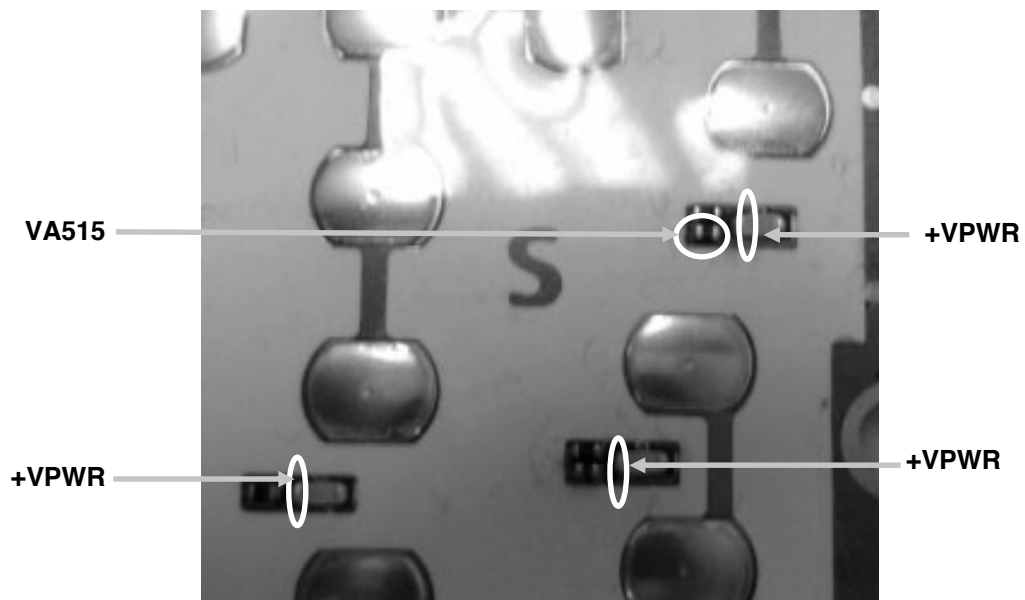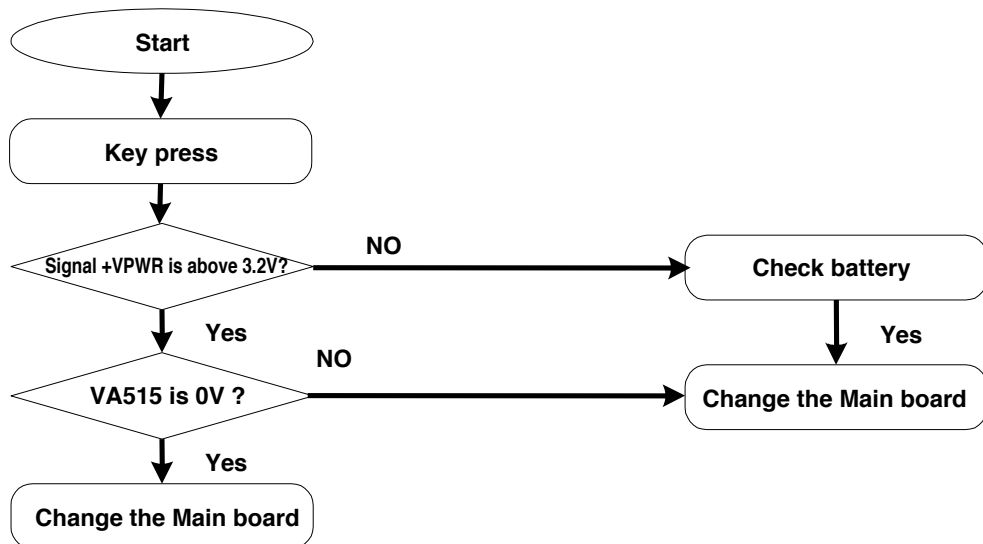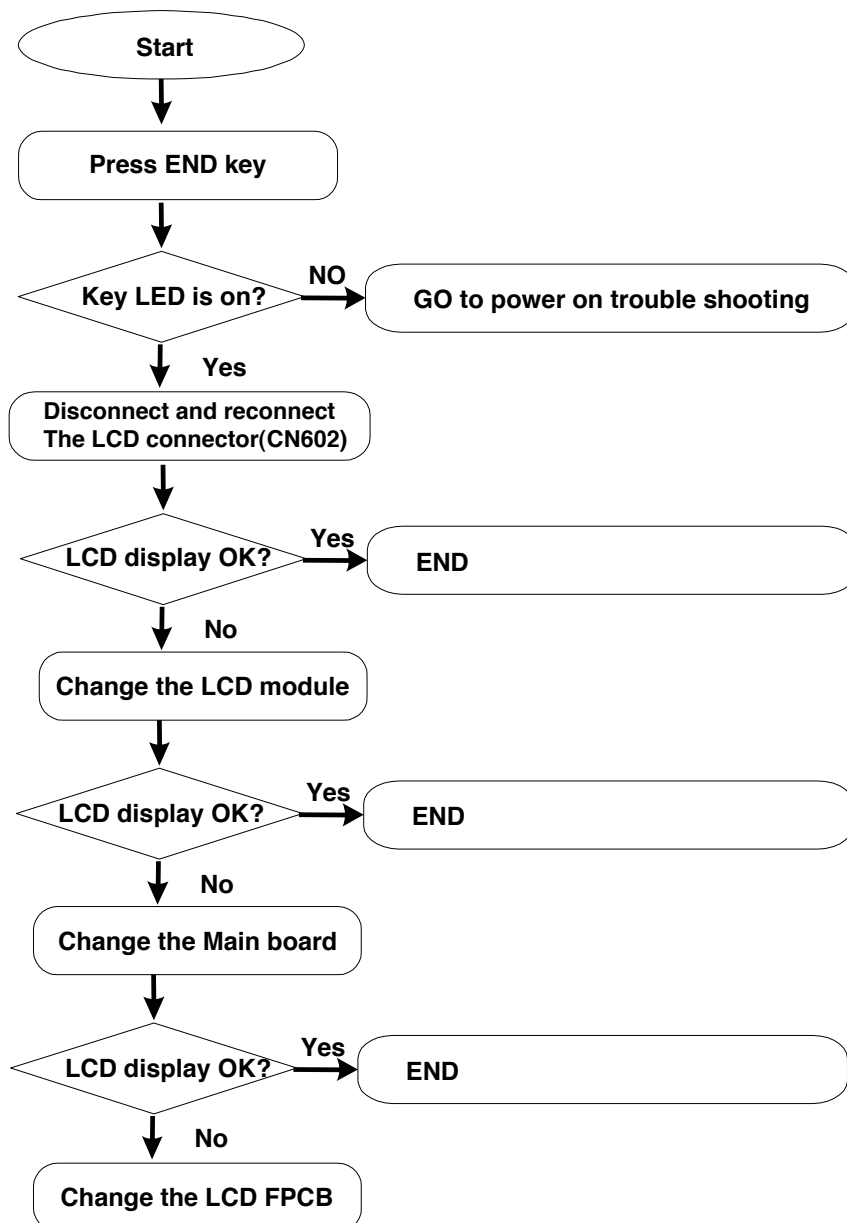
4.15 Audio Receiver Path

MSM6275 EAR1ON/EAR1OP → CN602 → CN1 → Receiver

```
                        ┌─────────────┐
                        │    Start    │
                        └─────────────┘
                               │
                               ▼
              ┌─────────────────────────────────┐
              │ Connect the phone to network     │
              │ Equipment and setup call         │
              │ Setup 1KHz tone out              │
              └─────────────────────────────────┘
                               │
                               ▼
                    ◇ Can you hear the tone? ◇ ──YES──▶  ┌─────────┐
                               │                          │   END   │
                              NO                          └─────────┘
                               ▼
                    ◇ The sine wave appears at ◇ ──YES──▶ ┌──────────────────┐
                      PIN33,PIN34, CN1?                   │ Change receiver  │
                               │                          └──────────────────┘
                              NO
                               ▼
                    ◇ The sine wave appears at ◇ ──YES──▶ ┌─────────────────────────────┐
                      PIN33,PIN34,CN602                   │ Check LCD FPCB.             │
                               │                          │ Check main/upper connector. │
                              NO                          └─────────────────────────────┘
                               ▼
              ┌──────────────────────────┐
              │  Change the Main board    │
              └──────────────────────────┘
```
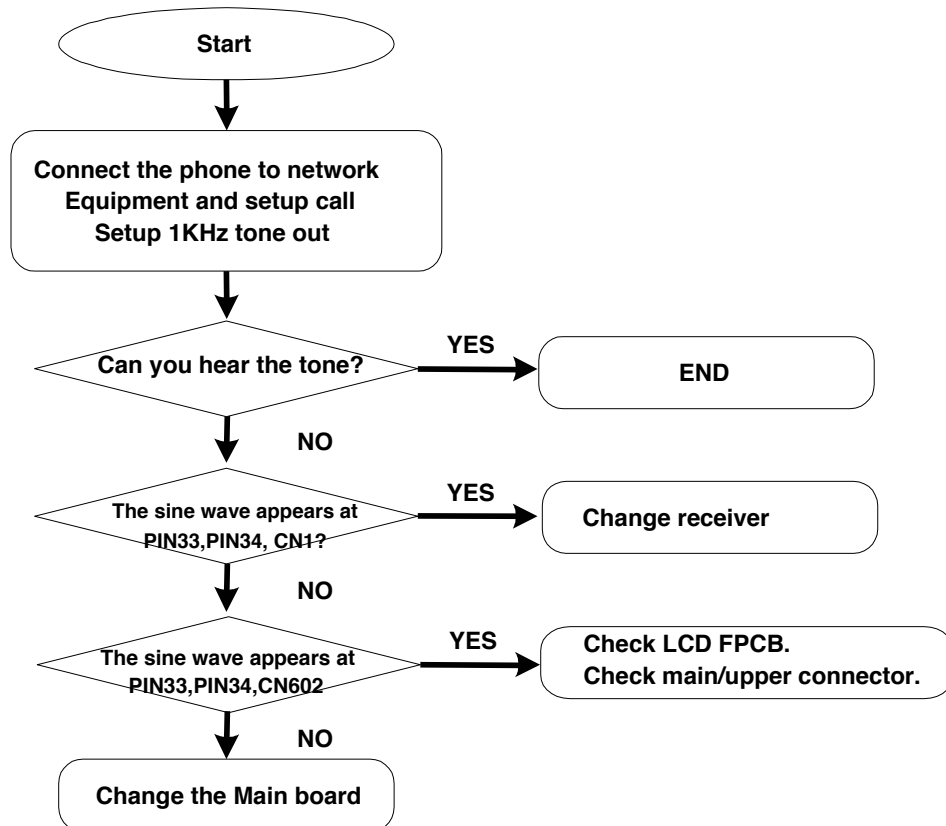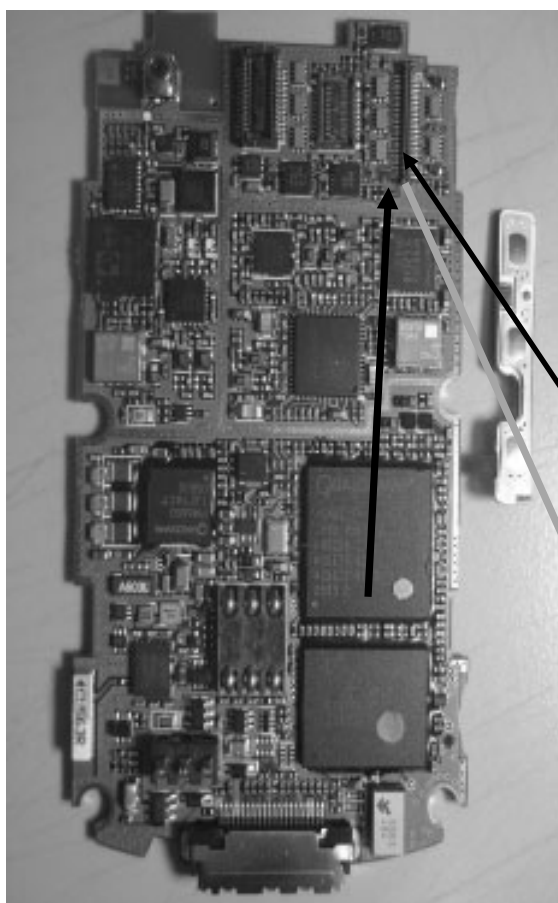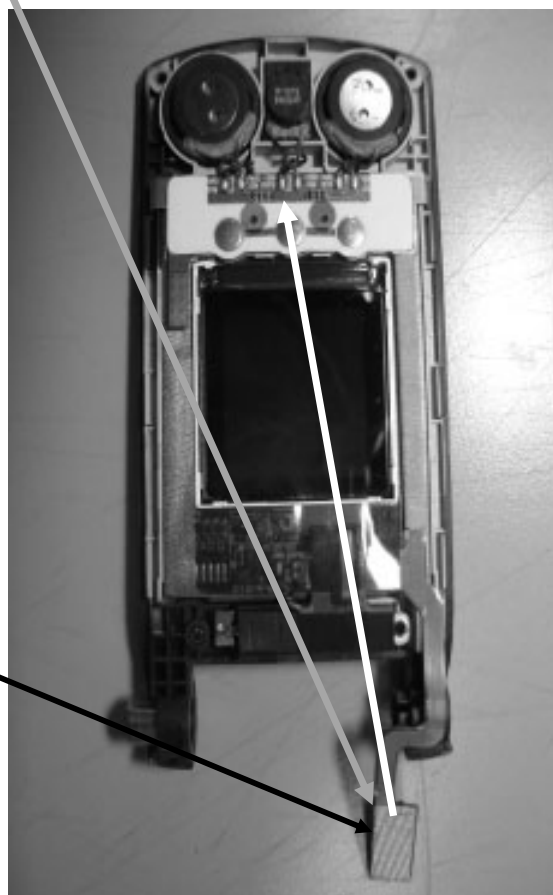
CN602
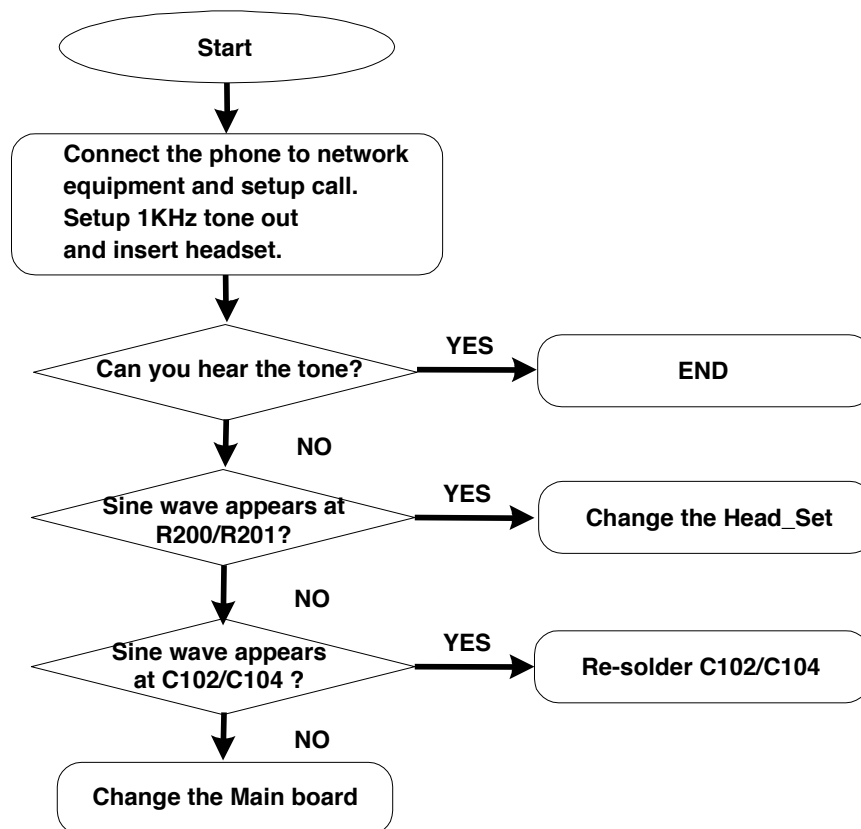
CN1

4.16 Headset path

MSM6275 HPH_R, HPH_L → C102/C104 → R200/R201 → CON100(Earjack)

```
                    ┌─────────────┐
                   (    Start      )
                    └──────┬──────┘
                           │
                           ▼
              ┌──────────────────────────┐
              │ Connect the phone to network │
              │ equipment and setup call.    │
              │ Setup 1KHz tone out          │
              │ and insert headset.          │
              └──────────────┬───────────┘
                             │
                             ▼           YES    ┌──────────────┐
                 < Can you hear the tone? > ───────> (     END      )
                             │                   └──────────────┘
                             │ NO
                             ▼           YES
                 < Sine wave appears at  > ───────> ( Change the Head_Set )
                 < R200/R201?            >
                             │
                             │ NO
                             ▼           YES
                 < Sine wave appears     > ───────> ( Re-solder C102/C104 )
                 < at C102/C104 ?        >
                             │
                             │ NO
                             ▼
                 ( Change the Main board )
```
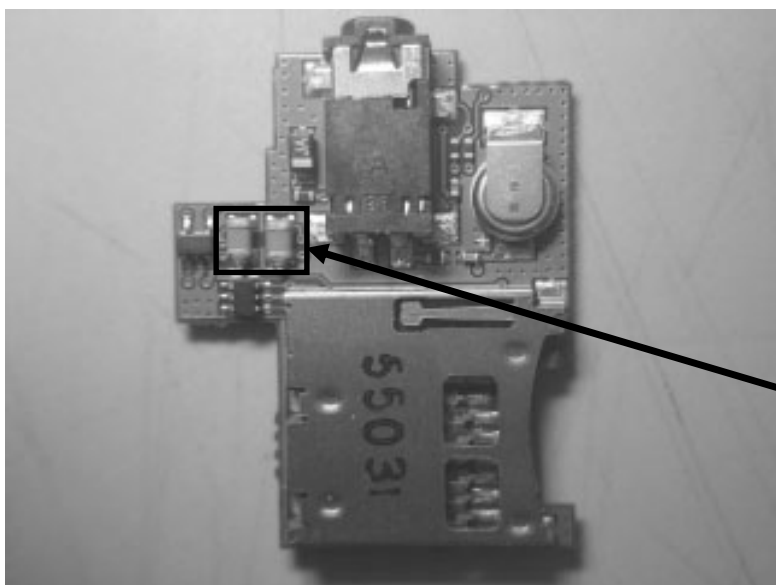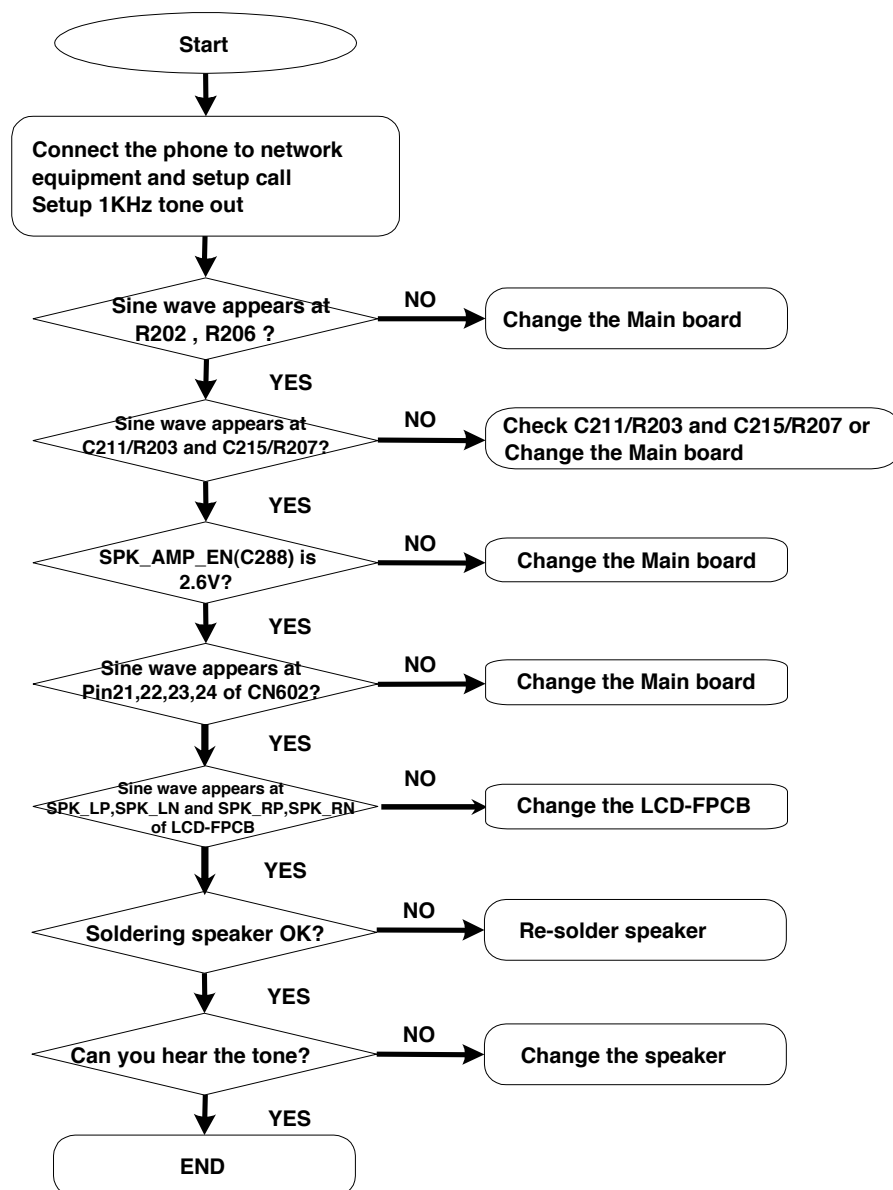
C102/
C104
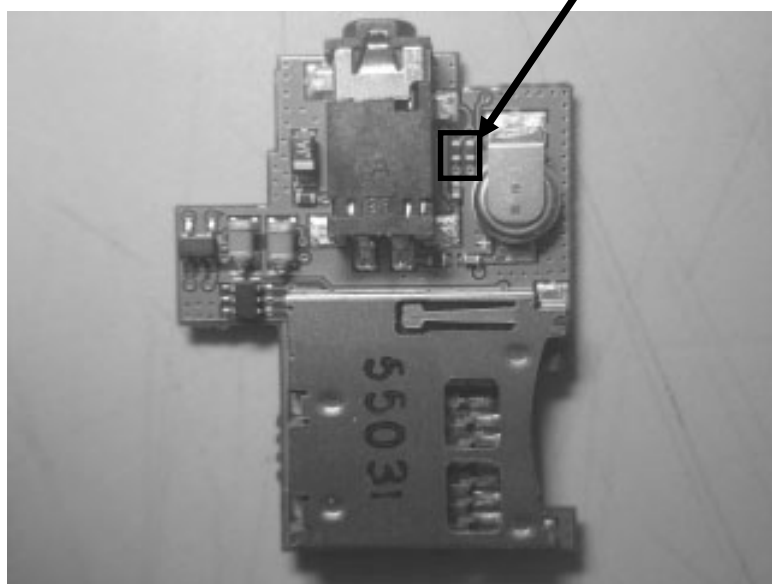
R200/
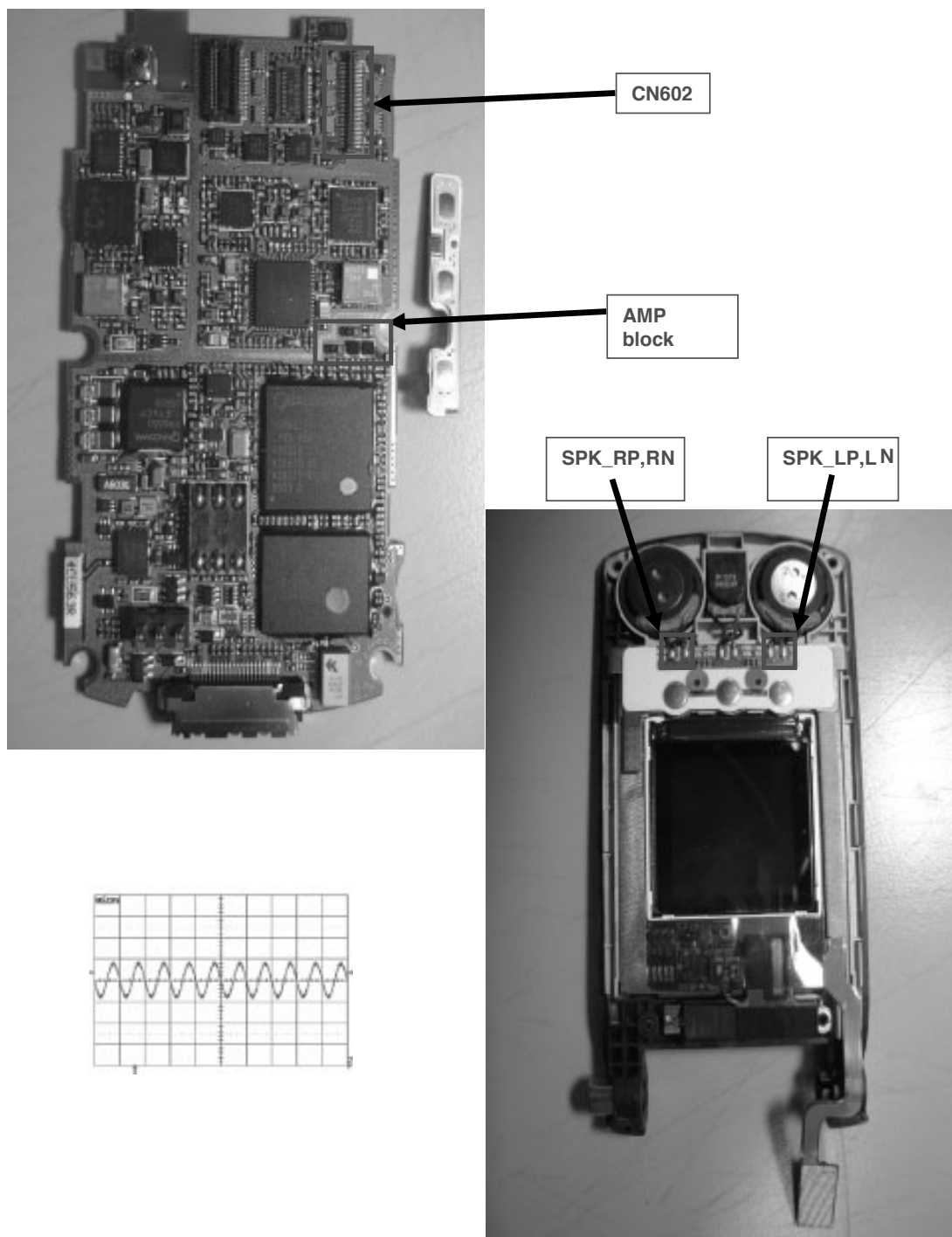R201

4.17 Speaker phone path

MSM6275 HPH_R, HPH_L
→ Filter block (SPK_R: R202/C210/C211/R203/R204/C212, SPK_L:
  R206/C214/C215/R207/R208/C216)
→ Audio AMP(SPK_R:U507, SPK_L:U506)
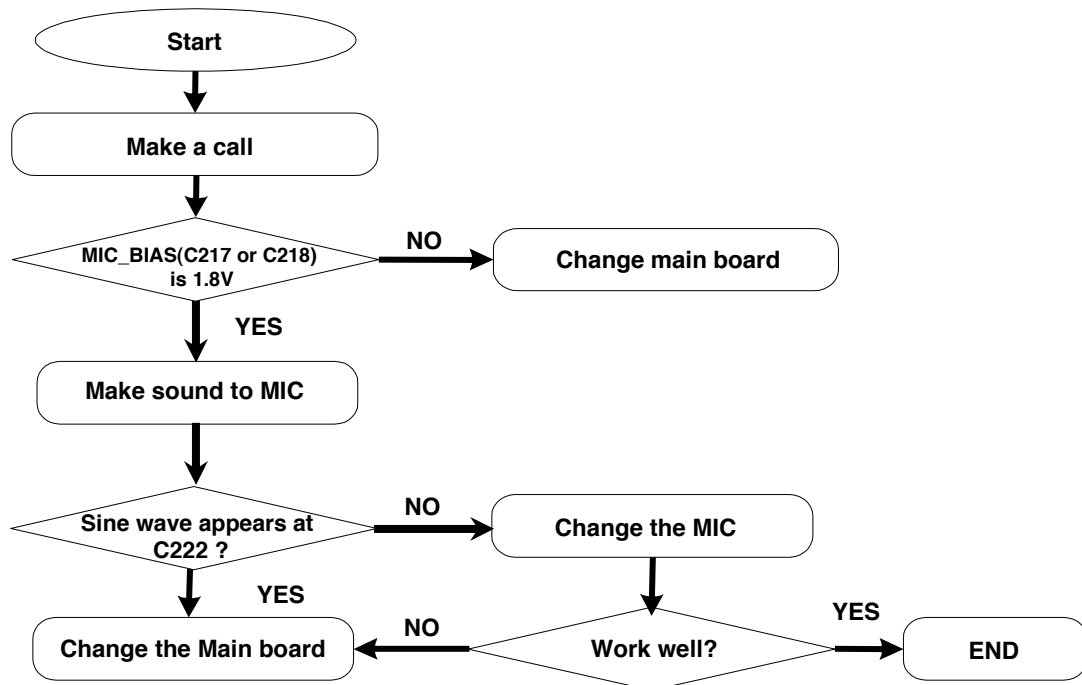→ SPK_R:SPK_RP,SPK_LP , SPK_L:SPK_LP,SPK_LN (connector) → Speaker

```
                    ┌─────────────┐
                    │   Start     │
                    └──────┬──────┘
                           ▼
        ┌──────────────────────────────────┐
        │ Connect the phone to network     │
        │ equipment and setup call         │
        │ Setup 1KHz tone out              │
        └──────────────┬───────────────────┘
                       ▼
        ◇ Sine wave appears at ──NO──▶ Change the Main board
          R202 , R206 ?
                  │ YES
                  ▼
        ◇ Sine wave appears at ──NO──▶ Check C211/R203 and C215/R207 or
          C211/R203 and C215/R207?      Change the Main board
                  │ YES
                  ▼
        ◇ SPK_AMP_EN(C288) is ──NO──▶ Change the Main board
          2.6V?
                  │ YES
                  ▼
        ◇ Sine wave appears at ──NO──▶ Change the Main board
          Pin21,22,23,24 of CN602?
                  │ YES
                  ▼
        ◇ Sine wave appears at ──NO──▶ Change the LCD-FPCB
          SPK_LP,SPK_LN and SPK_RP,SPK_RN
          of LCD-FPCB
                  │ YES
                  ▼
        ◇ Soldering speaker OK? ──NO──▶ Re-solder speaker
                  │ YES
                  ▼
        ◇ Can you hear the tone? ──NO──▶ Change the speaker
                  │ YES
                  ▼
            ┌─────────────┐
            │    END      │
            └─────────────┘
```
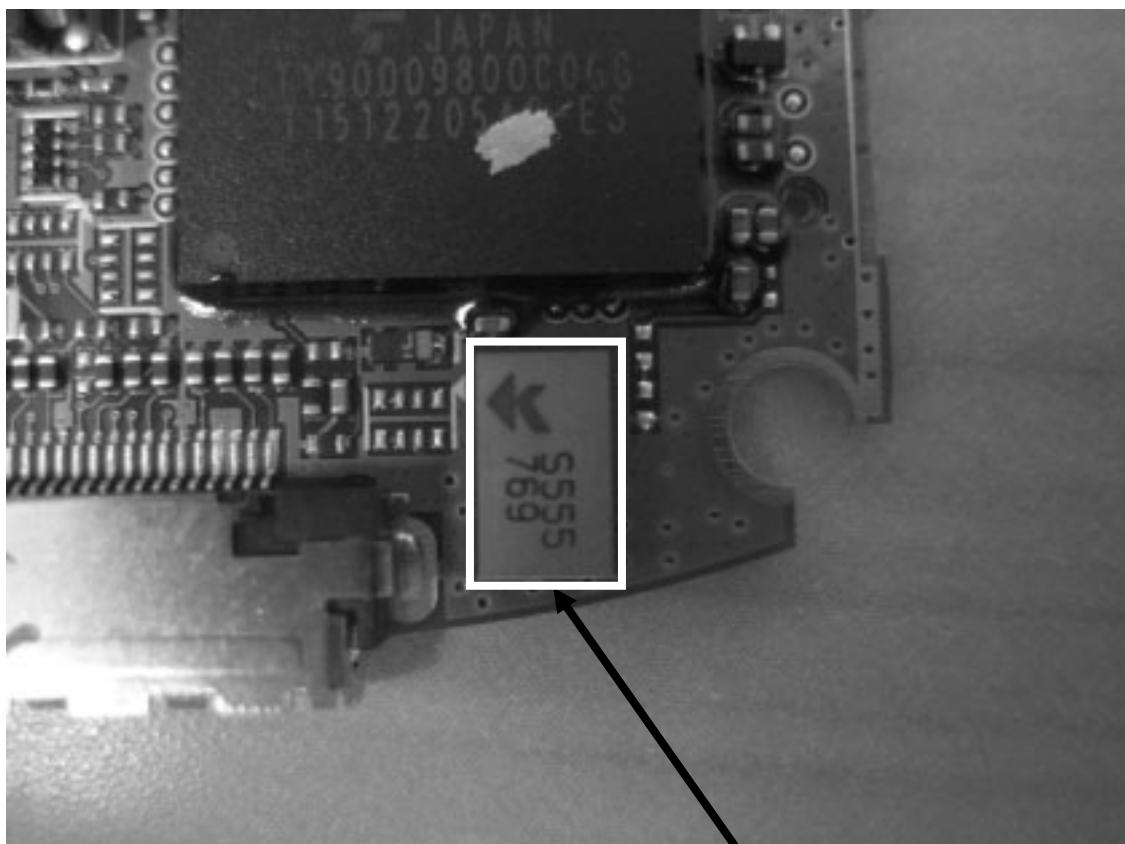
CN602

AMP block

SPK_RP,RN

SPK_LP,L N

4.18 Main microphone

U303 → C222 → MIC1P(MSM6275)

```
            ┌──────────────┐
            │    Start     │
            └──────────────┘
                   │
                   ▼
          ┌──────────────────┐
          │   Make a call    │
          └──────────────────┘
                   │
                   ▼
            ◇─────────────◇        NO    ┌────────────────────┐
           < MIC_BIAS(C217 >─────────────│  Change main board │
           <  or C218)      >            └────────────────────┘
            < is 1.8V      >
             ◇───────────◇
                   │ YES
                   ▼
          ┌──────────────────┐
          │ Make sound to MIC │
          └──────────────────┘
                   │
                   ▼
            ◇─────────────◇        NO    ┌────────────────────┐
           < Sine wave     >─────────────│   Change the MIC   │
           < appears at     >            └────────────────────┘
            < C222 ?       >                      │
             ◇───────────◇                        ▼
                   │ YES                     ◇─────────◇       YES   ┌─────────┐
                   ▼            NO           < Work well? >──────────│   END   │
          ┌──────────────────┐◄─────────────◇─────────◇            └─────────┘
          │ Change the Main  │
          │     board        │
          └──────────────────┘
```

MIC(U303)

4.19 Headset microphone

Headset → C106 → MIC2P(MSM6275)

```
                    ┌─────────────┐
                    │    Start     │
                    └──────┬──────┘
                           │
                    ┌──────▼──────┐
                    │ Make a call  │
                    └──────┬──────┘
                           │
                           │              OK
          ┌────────────────▼─────────┐ ──────────►  ┌──────────────┐
          │ Change the headset and retry │            │     END      │
          └────────────────┬─────────┘            └──────────────┘
                           │ NO                          ▲
                           │                             │ YES
                  ┌────────▼────────┐    NO     ┌─────────────────────┐
                  │  EAR_SENSE_N    │ ────────► │ Change the headset or│
                  │ (R109) is 0V?   │           │ SUB board and retry. │
                  └────────┬────────┘           └──────────┬──────────┘
                           │ Yes                           │ NO
                  ┌────────▼────────┐    NO     ┌─────────────────────┐
                  │ VREG_MSMP is biased│ ──────►│  Change MAIN board  │
                  │ by 2.6V? (R100)  │          └─────────────────────┘
                  └────────┬────────┘
                           │ Yes
                  ┌────────▼────────┐    NO     ┌─────────────────────┐
                  │ Sine wave appears at│ ─────►│ Change the headset or│
                  │     C106 ?      │           │ SUB board and retry. │
                  └────────┬────────┘           └─────────────────────┘
                           │ Yes
                  ┌────────▼────────┐
                  │ Change the Main B'd │
                  └─────────────────┘
```

Headset detect port

Mic input
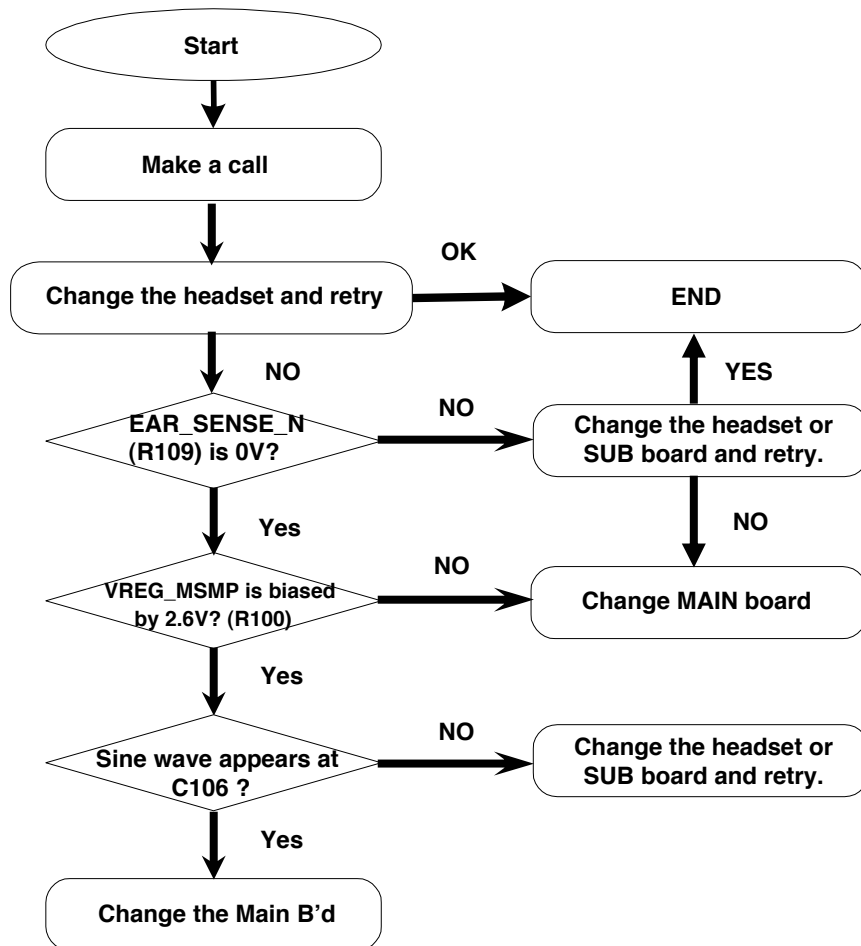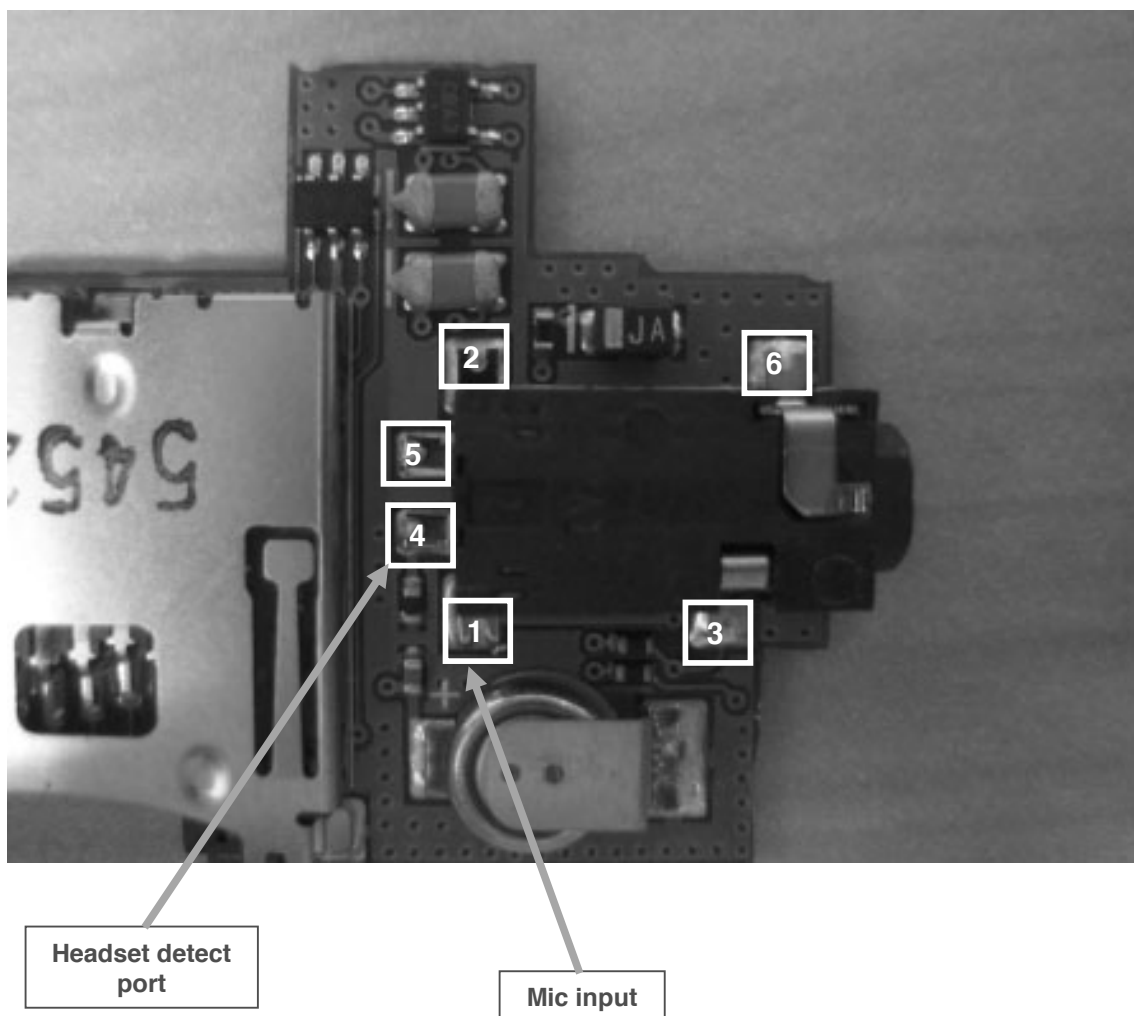
5. DOWNLOAD

5.1 Introduction

LGMDP is a LGE application that allow users to download images from PC to handset. LGMDP is a download tool with capabilities to upload image files to the handset. LGMDP is designed to be simple to use and easy enough for the beginner to upload executable images to the handset. LGMDP supports Windows 2000/XP where the LG (Ver 4.6 or later) USB modem driver is installed. Additionally, LGMDP allows multi downloading up to 8 handsets at the same time.

Connect the phone to your desktop PC using the USB cable and run the LGMDP application. Before getting started, set up LGMDP preferences from the Preferences of the file menu the way you want. Click on the File menu and select Preferences.

5.2 Downloading Procedure

1) Setup Preferences

→ Play a success sound
  This is an experimental feature. To enable this simply check the box. It will be played a .wav file when the download has been completed.

→ Automatically run °∞Select Port°± When LGMDP starts
  This option is designed to give user convenient. When LGMDP starts, it will automatically select °∞Select Port°± button to download new image file.

→ Always on Top
  Check if LGMDP always appears at the top of the window so that user can monitor it all the time.

→ Windows Size
  If you want to change program window size, change this option.
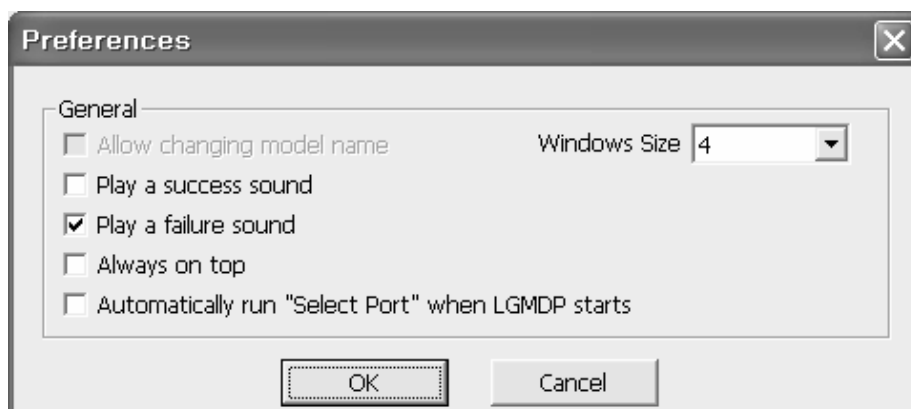
1) Connecting to PC

Click on the Select Port and then Select Port window will be pop up. Check if state shows Enable for the port to be connected for downloading images. Then click on the Connect button.

(The port number(COM7) and model name shall be different from that of the port number in the snapshot.)
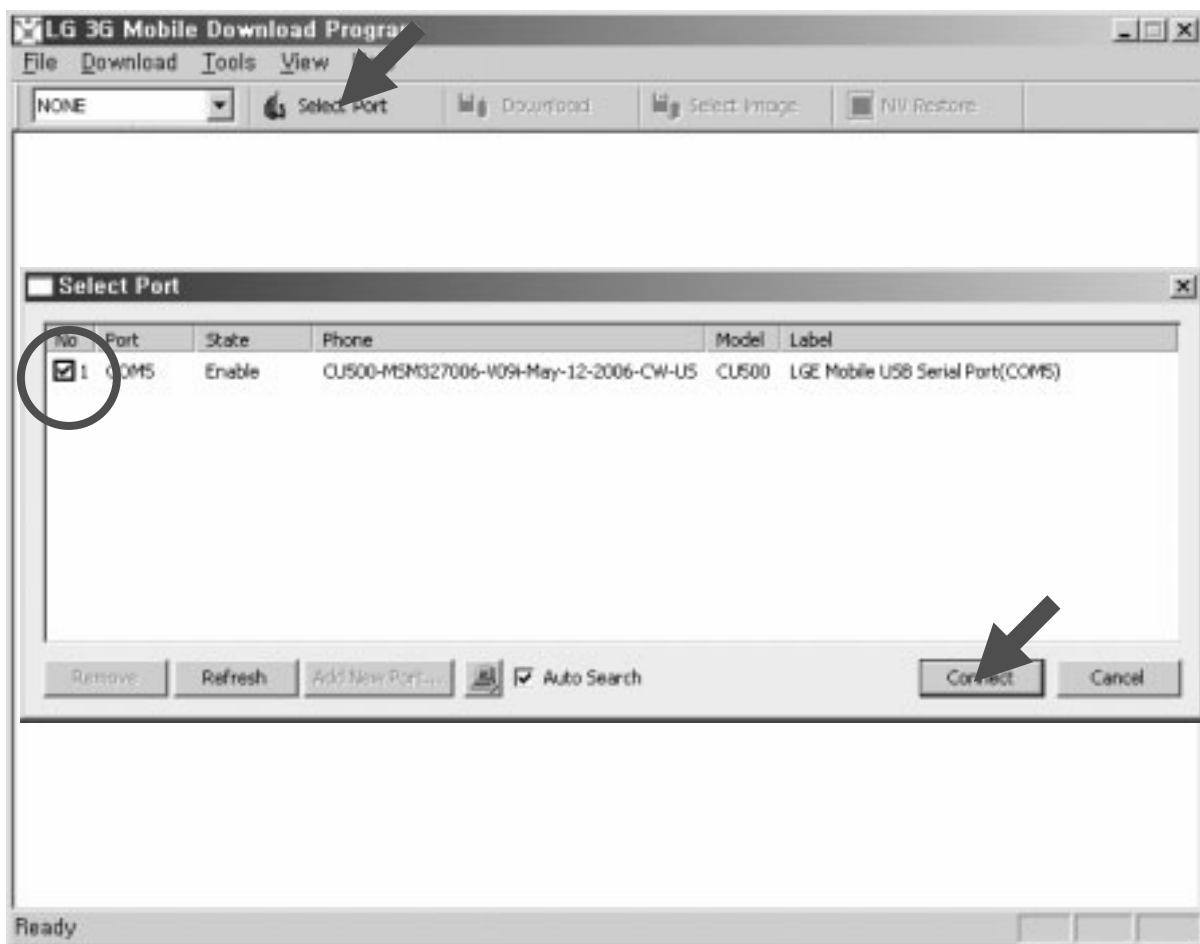
The status Ready is displayed when the application is ready for downloading. While the images are transmitted from PC to the handset, a progressive bar (Red box) indicating the degree of transmission of data is displayed.
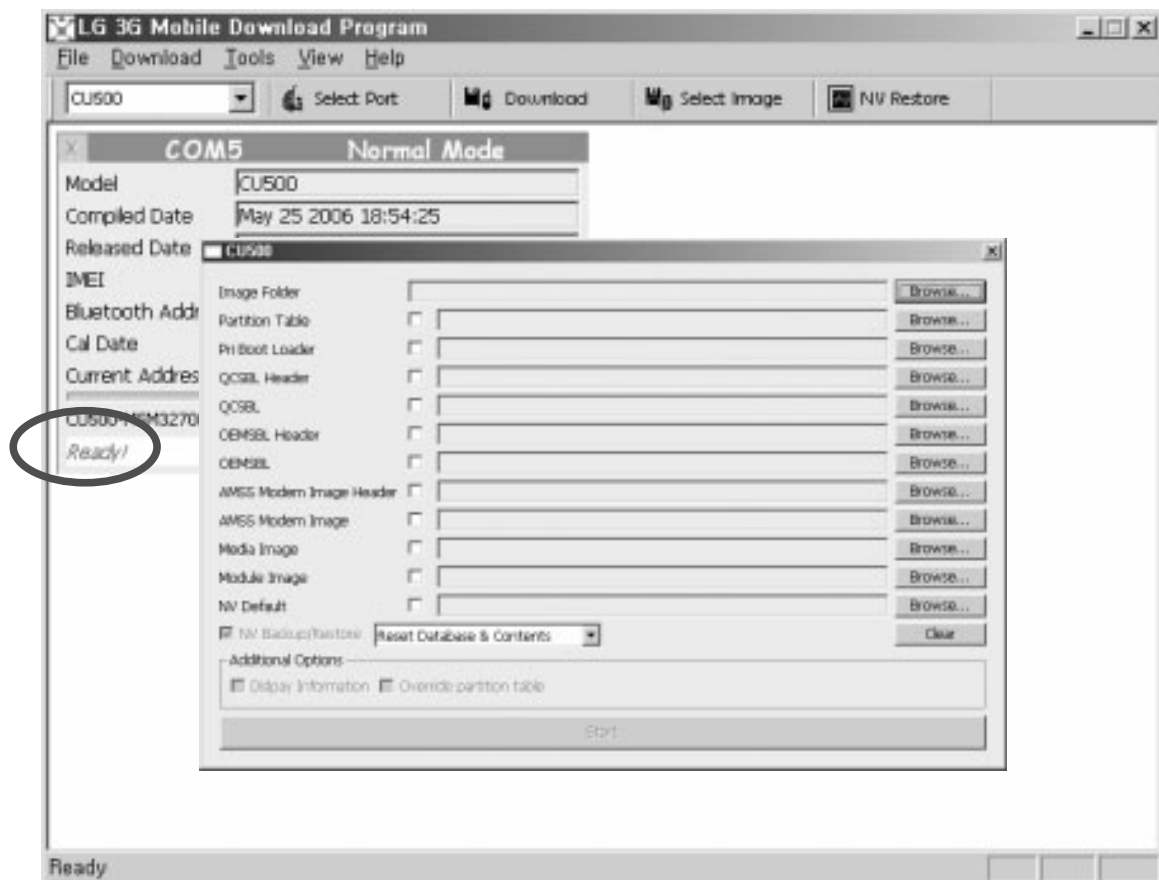
5. DOWNLOAD

The following slide describes how to use or set options in detail.

(The model name shall be different from that of the model name in the snapshot.)

1) Image Folder indicates loot path where all image files are placed. To change location of the default image path, select Browse°¶ button. The edit box shows the file path where new images are located. Please note that all images should be located in a selected folder.
(This program support the automatically loading image for some models based on MSM6275)
2) Click on the Browse°¶ button to select image files to be downloaded on the handset.
3) NV Backup/Restore: NV Backup/Restore always have to be done, and it is default selected option.
Backup the NV data and restore the backed up NV data automatically.
4) Reset database & Contents: User related data including the setting data on the EFS is reset in the handset. The contents in the handset will be erased.
Erase_EFS: The calibration data, user contents, media, and module are erased. Only calibration data is kept when NV backup/restore is checked.
Keep All Contents: Maintain user data including WAP, AD, DRM, Email, Play lists, images When downloading a new images, user data stated above are maintained if this option is enable.
5) Additional Options:
Display Information is defaulty not selected and user cannot choose.
Security: The security option is automatically selected based on the selected country when security box is selected.
→ Integrity is selected when the selected country is UK, Italy, Hong Kong, Austria, or Israel.
→ Ciphering is not applied or used for H3G user.
→ Fake Security is not applied or used for H3G user.
→ Integrity + Ciphering is selected when the selected country is Australia, Sweden, or Denmark.
Please note that user cannot select the options stated above on the security
6) Clear: Clearing all directory paths of images in the dialog.
7) Override Partition Table : If memory map was changed, you must select this option. (Defaultly selected option)
8) Start : Starting downloading the selected individual image.

2) Choosing image files

Select the image folder, where all the image files are located, by clicking on the Browse°¶ button. (The folder name shall be different from that of the folder name in the snapshot. The folder name indicates the path where the image files are located.)

★ if you select the image folder, the program will automatically load images accordingly.
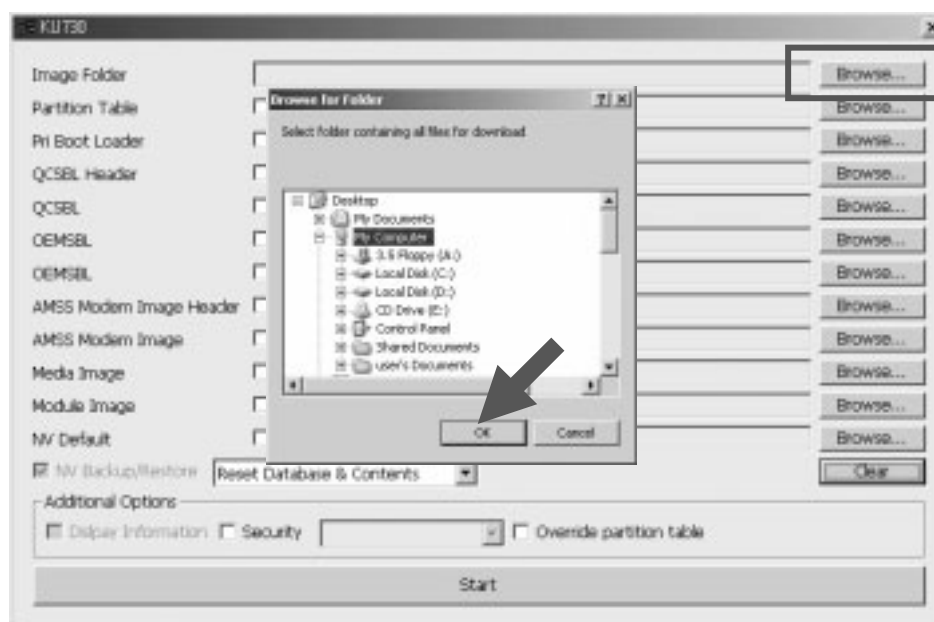
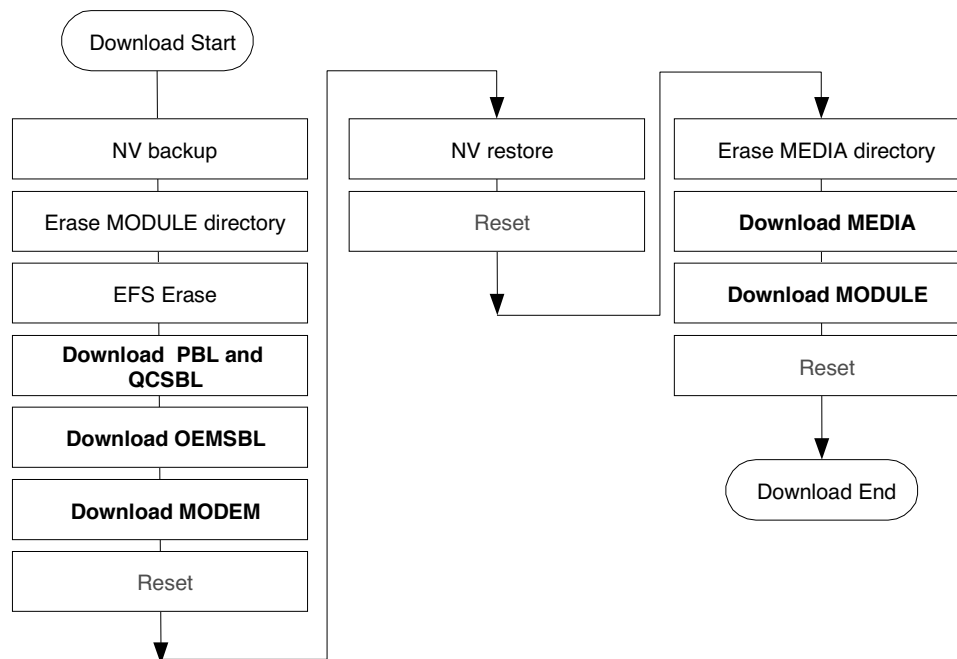★ if you select the image folder, the program will automatically load images accordingly.

Automatically load images
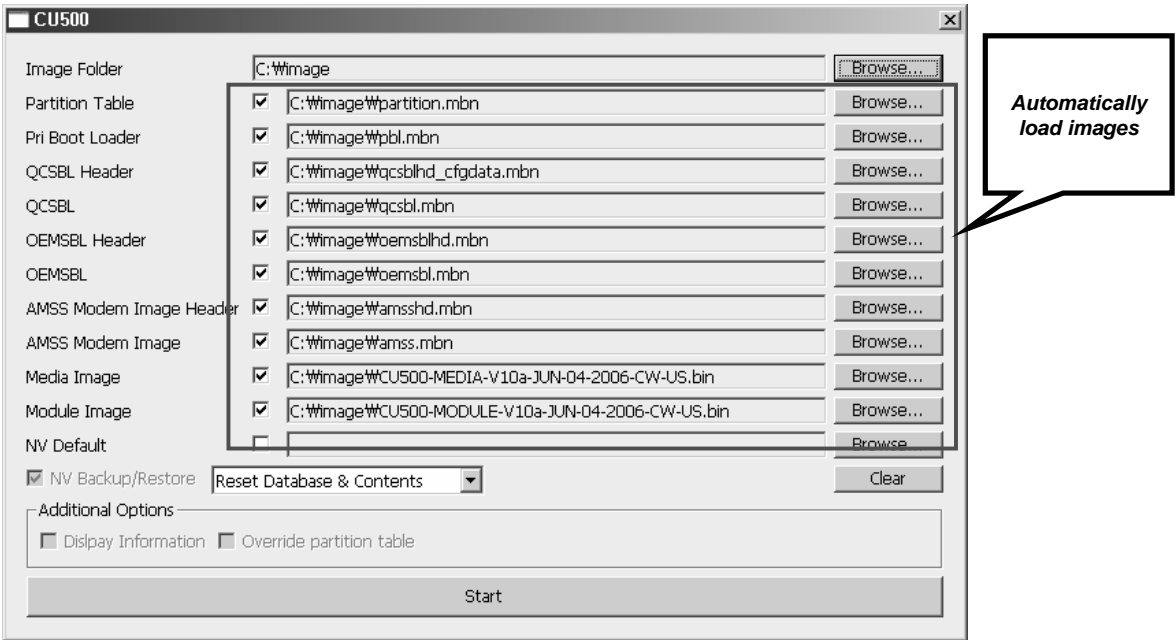
5. DOWNLOAD

If NV restore is failed, then the NV Data(*.nv2) is erased permantly. In this case, choose the desired NV file to be downloaded on the handset. To enable this simply check the box or select the NV file from the LGMDP installation directory by clicking on the Browse°¶ button.
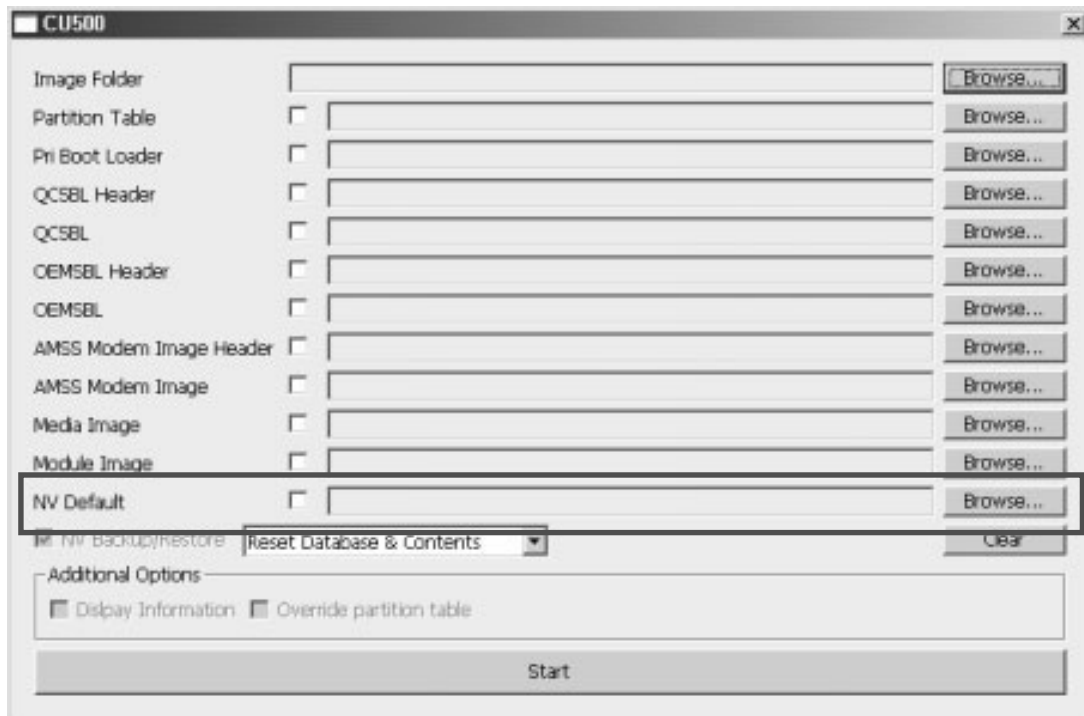
Click on the START button to start downloading. Normally LGMDP will downloaded all files that need downloading. To download selected image file only simply select the image file that user want to process downloading.
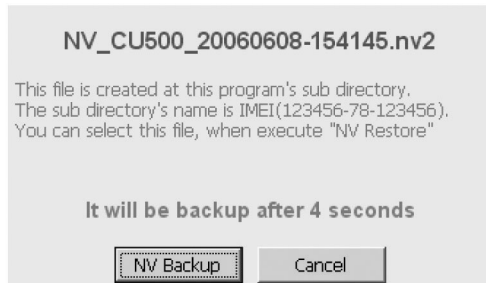
3) Downloading

The following flow chart is whole process for downloading images to the handset. You will see snapshots for each step in the succeeding slides.
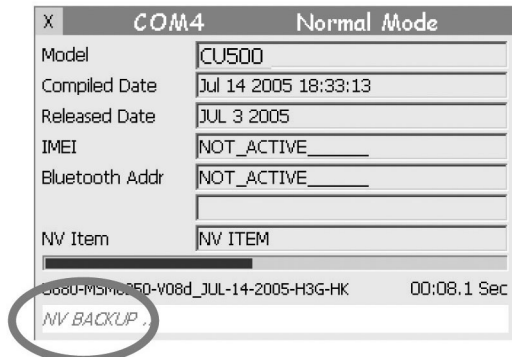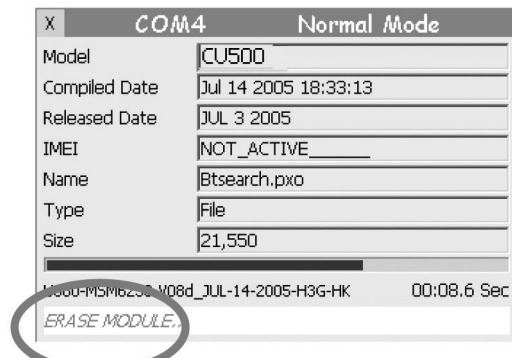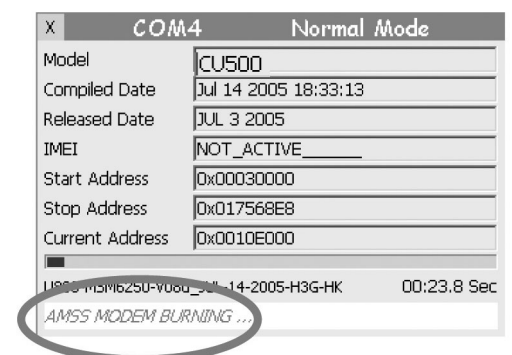
```
┌──────────────┐        ┌──────────────┐        ┌──────────────────────┐
│ Download Start│        │  NV restore  │        │ Erase MEDIA directory│
└──────┬───────┘        └──────┬───────┘        └──────────┬───────────┘
       │                       │                           │
┌──────┴───────┐        ┌──────┴───────┐        ┌──────────┴───────────┐
│  NV backup   │        │    Reset     │        │   Download MEDIA     │
└──────┬───────┘        └──────┬───────┘        └──────────┬───────────┘
       │                       │                           │
┌──────┴───────┐               │                ┌──────────┴───────────┐
│Erase MODULE  │               │                │  Download MODULE     │
│  directory   │               │                └──────────┬───────────┘
└──────┬───────┘                                           │
       │                                        ┌──────────┴───────────┐
┌──────┴───────┐                                │        Reset         │
│  EFS Erase   │                                └──────────┬───────────┘
└──────┬───────┘                                           │
       │                                        ┌──────────┴───────────┐
┌──────┴───────┐                                │    Download End      │
│Download PBL  │                                └──────────────────────┘
│ and QCSBL    │
└──────┬───────┘
       │
┌──────┴───────┐
│Download OEMSBL│
└──────┬───────┘
       │
┌──────┴───────┐
│Download MODEM │
└──────┬───────┘
       │
┌──────┴───────┐
│    Reset     │
└──────────────┘
```

<Download process>

NV_CU500_20060608-154145.nv2

This file is created at this program's sub directory.
The sub directory's name is IMEI(123456-78-123456).
You can select this file, when execute "NV Restore"

It will be backup after 4 seconds

[NV Backup]   [Cancel]

• This message box informs that a new file for NV backup will be created in the displayed file name in the LGMDP installation directory.

X	COM4	Normal Mode
Model	CU500	
Compiled Date	Jul 14 2005 18:33:13	
Released Date	JUL 3 2005	
IMEI	NOT_ACTIVE_____	
Bluetooth Addr	NOT_ACTIVE_____	
NV Item	NV ITEM	

U680-MSM6250-V08d_JUL-14-2005-H3G-HK   00:08.1 Sec
NV BACKUP .

• Backing up NV data and backed up NV data will be stored in the LGMDP installation directory.

X	COM4	Normal Mode
Model	CU500	
Compiled Date	Jul 14 2005 18:33:13	
Released Date	JUL 3 2005	
IMEI	NOT_ACTIVE_____	
Name	Btsearch.pxo	
Type	File	
Size	21,550	

U680-MSM6250-V08d_JUL-14-2005-H3G-HK   00:08.6 Sec
ERASE MODULE.

• Erasing the existing directories and files before the Module image is downloaded.

X	COM4	Normal Mode
Model	CU500	
Compiled Date	Jul 14 2005 18:33:13	
Released Date	JUL 3 2005	
IMEI	NOT_ACTIVE_____	
Start Address	0x00030000	
Stop Address	0x017568E8	
Current Address	0x0010E000	

U680-MSM6250-V08d_JUL-14-2005-H3G-HK   00:23.8 Sec
AMSS MODEM BURNING ...

• Downloading the AMSS modem image

|	
X COM4 Normal Mode It will be restore after rebooting. Trying to communicate with phone!! Checking..(5 sec) [NV Restore] [Cancel]	• Rebooting the handset and re-establishing the connection
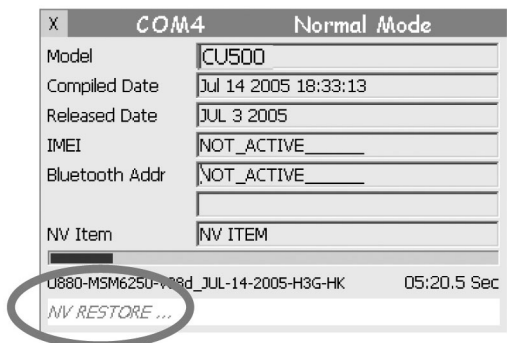
X COM4 Normal Mode Model CU500 Compiled Date Jul 14 2005 18:33:13 Released Date JUL 3 2005 IMEI NOT_ACTIVE_____ Bluetooth Addr NOT_ACTIVE_____ NV Item NV ITEM U880-MSM6250-V28d_JUL-14-2005-H3G-HK 05:20.5 Sec *NV RESTORE ...*	• Restoring NV data which backed up in the Backing up process. User can also restore NV data using NV Default image selection.

X COM4 Normal Mode Trying to communicate with phone!! 4 seconds [OK] [Cancel]	• Rebooting the handset and re-establishing the connection
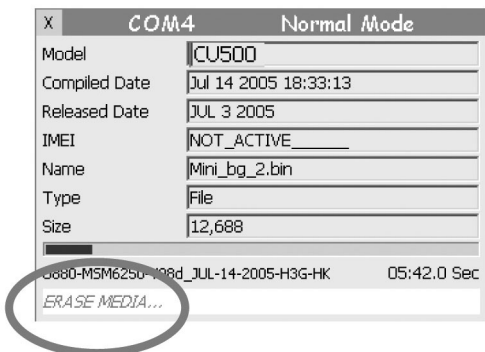
X COM4 Normal Mode Model CU500 Compiled Date Jul 14 2005 18:33:13 Released Date JUL 3 2005 IMEI NOT_ACTIVE_____ Name Mini_bg_2.bin Type File Size 12,688 U880-MSM6250-V28d_JUL-14-2005-H3G-HK 05:42.0 Sec *ERASE MEDIA...*	• Erasing the existing directories and files before downloading the selected Media image

5. DOWNLOAD

• Downloading Media image in progress

• Downloading Module image in progress

• Downloading process has completed
  successfully

4) Tools

Device Manager allows to monitor current hardware that is installed on your PC.
Device Manager is designed to monitor USB connectivity and check where the COM has been
installed . Select Device Manager from the Tools of the file menu.
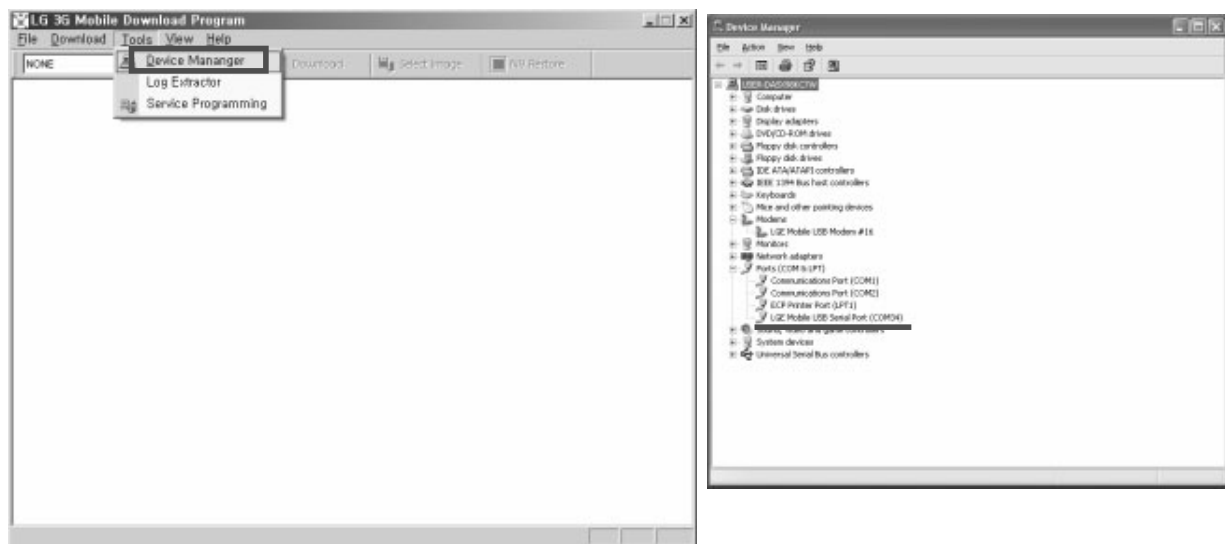
5. DOWNLOAD

Log Extractor is designed to extract log information from handset and store log related files in the selected root path in PC. This function is very useful for debugging. Select Log Extractor from the Tools of the file menu, and connect the phone with LGMDP by clicking on the Connect button. When clicking on the Connect button, this checks if the appropriate files such as LFAPP/RecMngr.bin, err directory, Debugging_Tip.txt, or Hidden_info.bin are placed on the handset. If they are exist, then appropriate check boxes are checked accordingly. Select directory to store log files by clicking on the °¶ button.
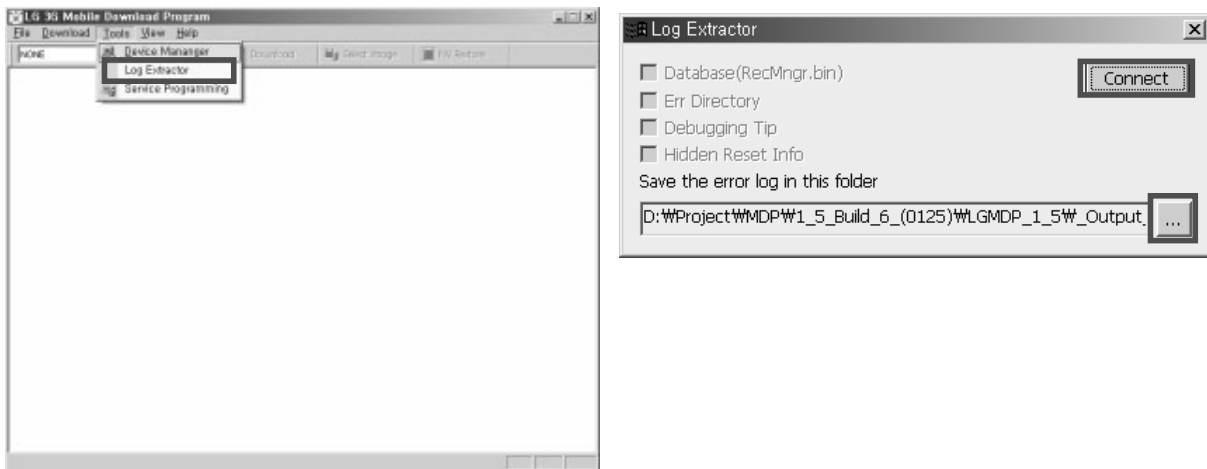
5.3 Troubleshooting Download Errors

1) When the phone does not work after downloading has been completed.

→ Reboot the phone as the emergency mode (keep pressing °∞2°± and °∞5°± key while the phone is being booted). and then try to download the images again.
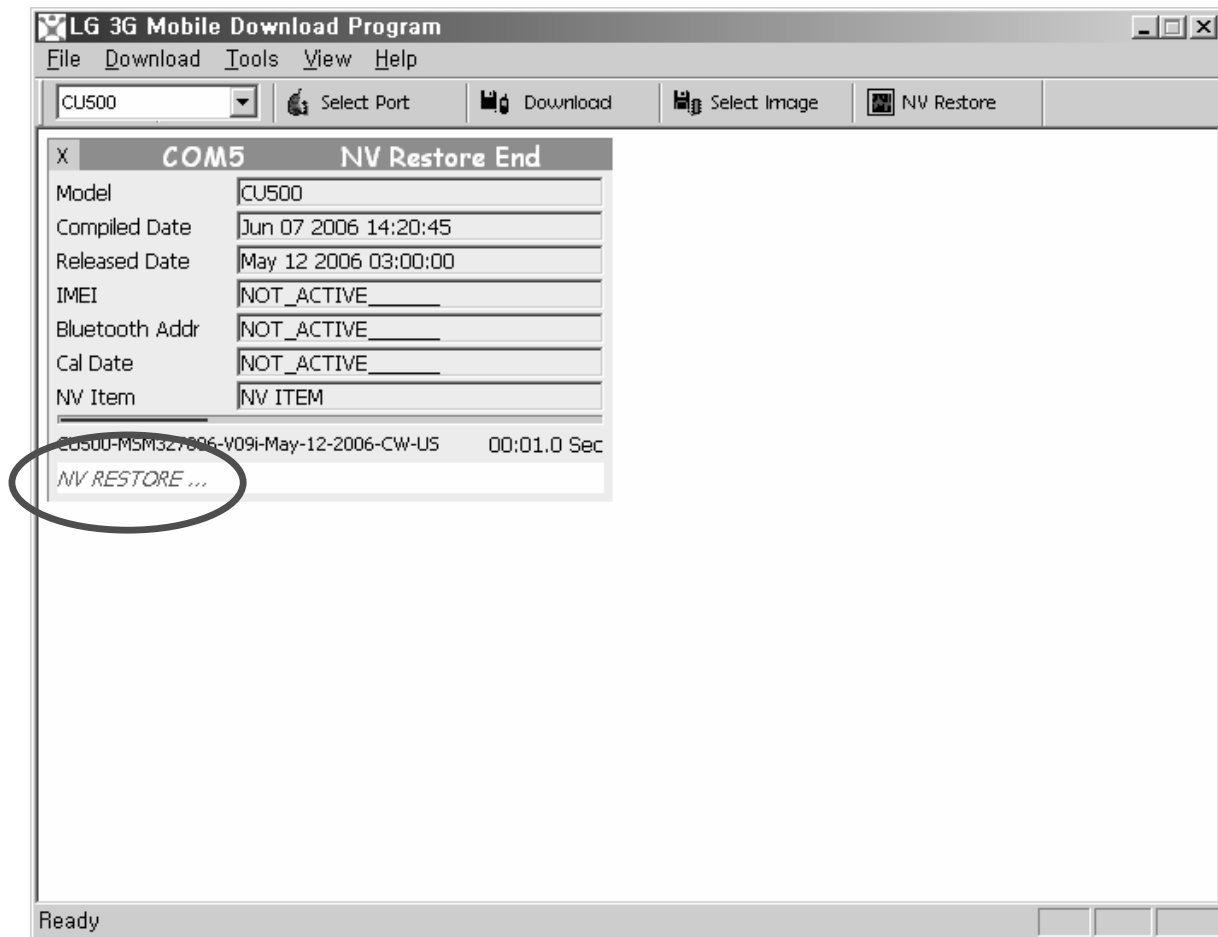
★ The phone supports a special mode named emergency mode. In this mode, minimum units for downloading is running so that users can download the images again in case of emergency situation. (AMSS Modem, Media and Module Images don't be running in this mode.)
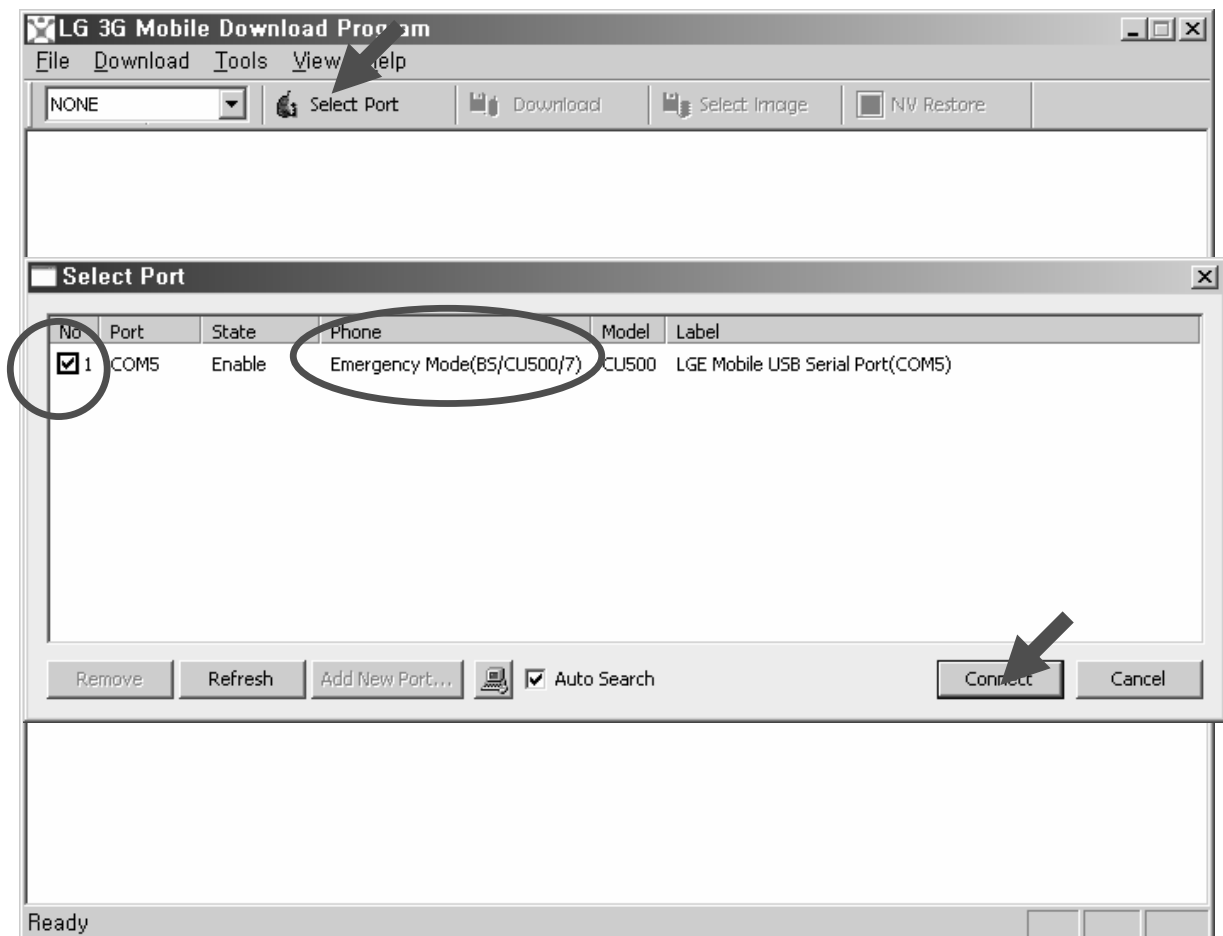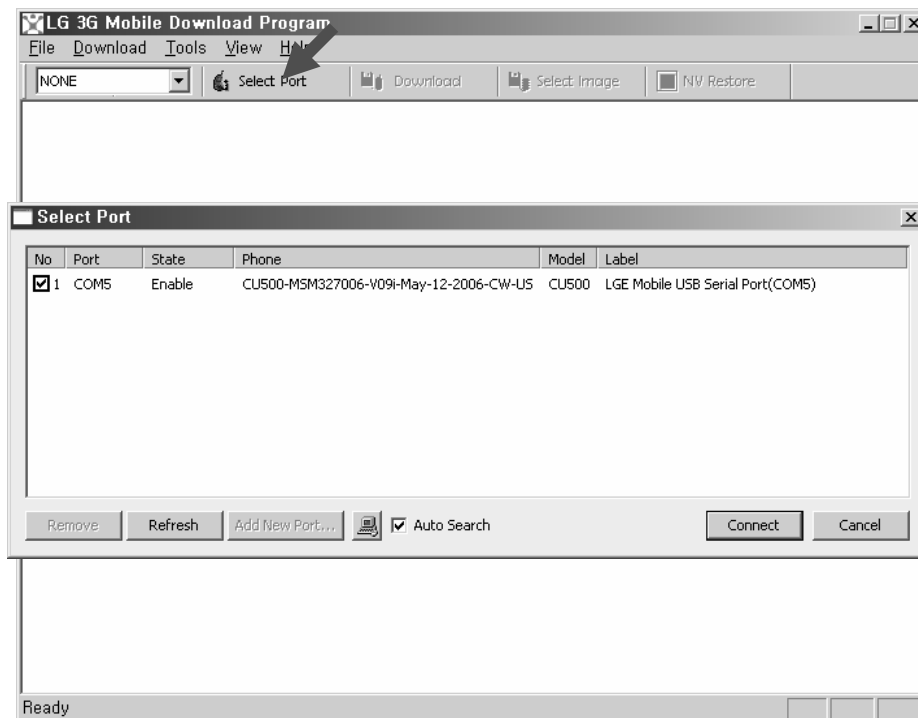
5. DOWNLOAD

3) NV Restore error
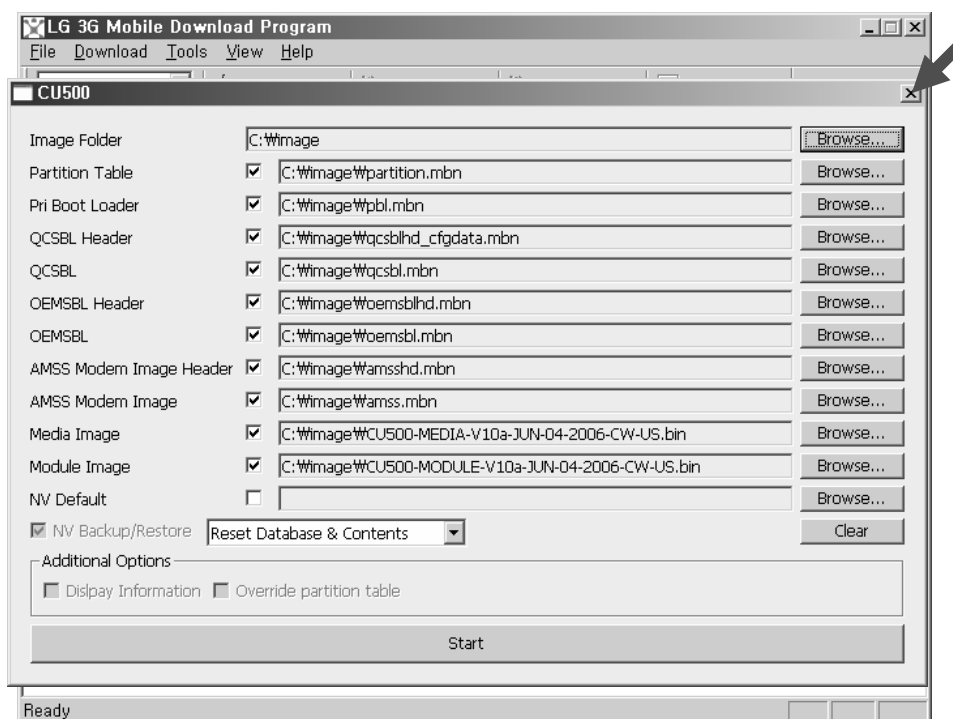
When you meet the °∞NV Restore error°±,
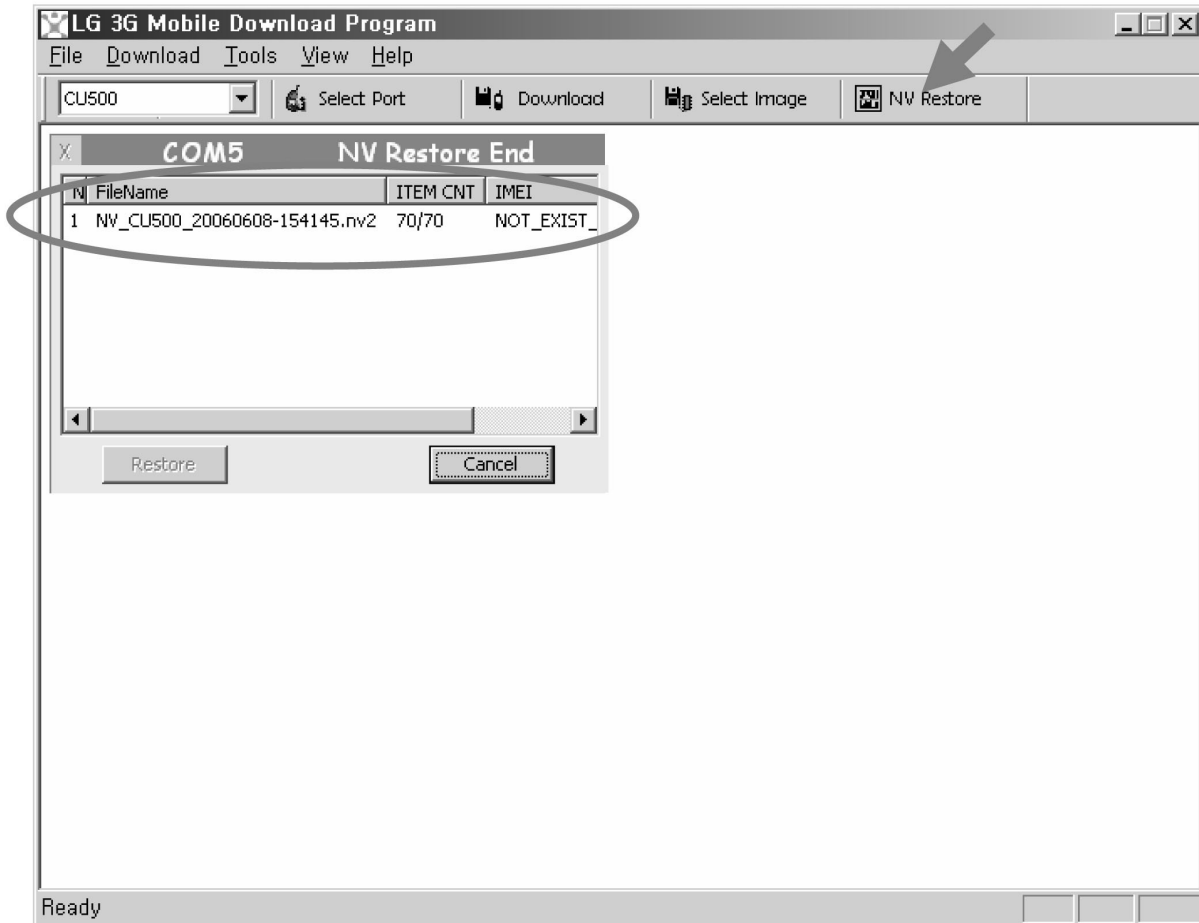
→ Connect to the phone.
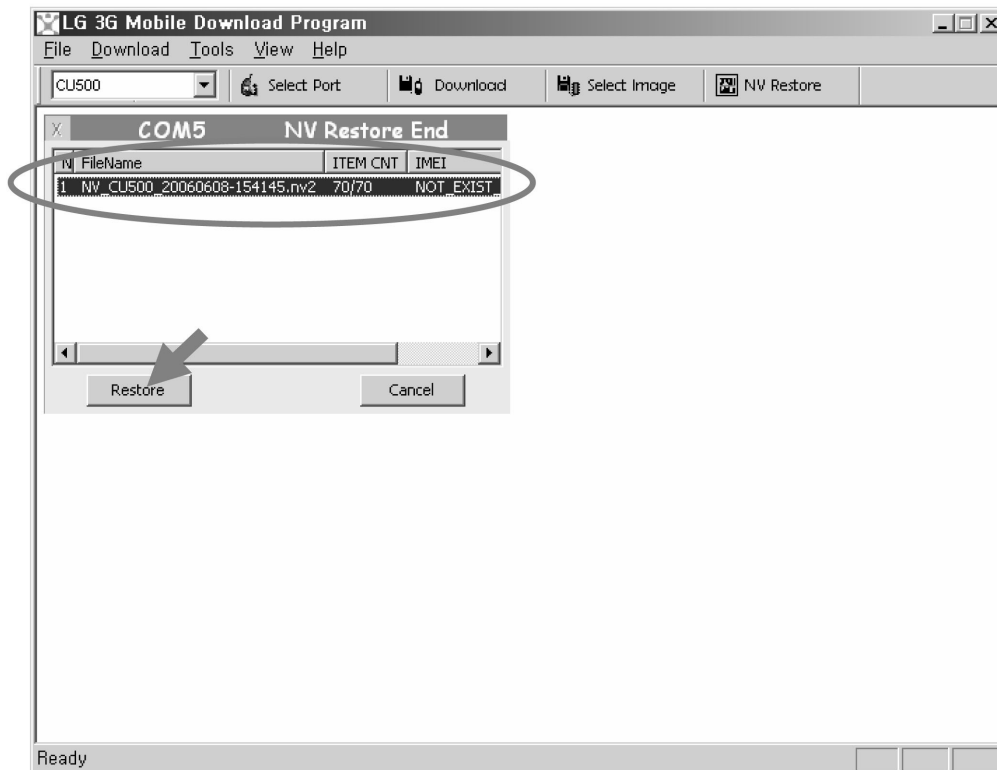

→ Click on 'Cancel'.

5. DOWNLOAD

→ Click on 'NV Restore' then several NV Backup files(*.nv2) are shown.

* The files are saved every NV Backup. The name is based on the time when NV Backup is done.)
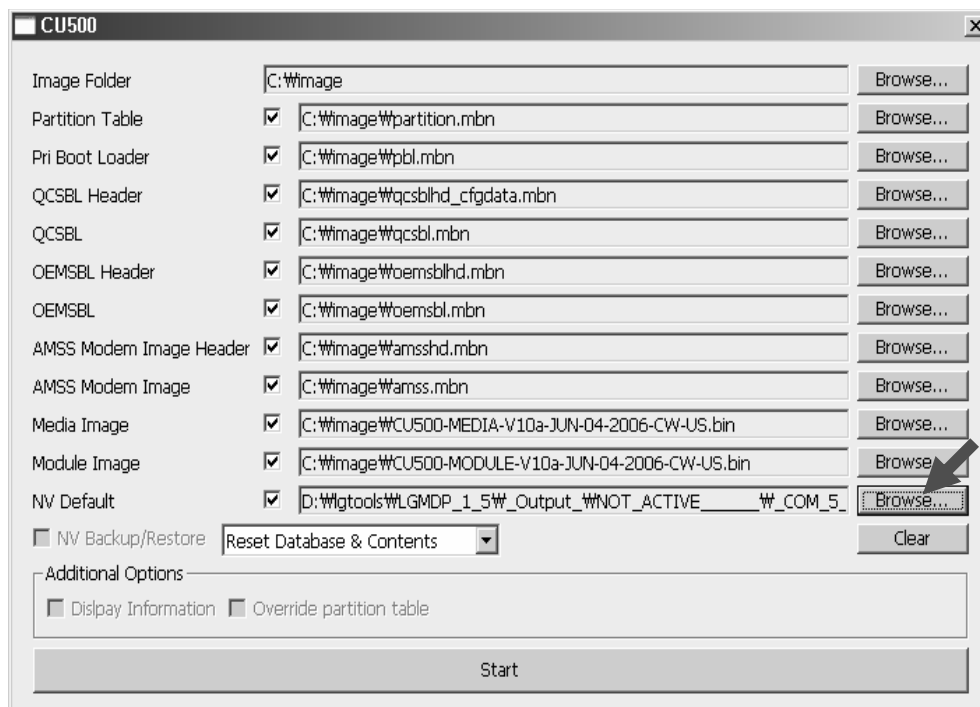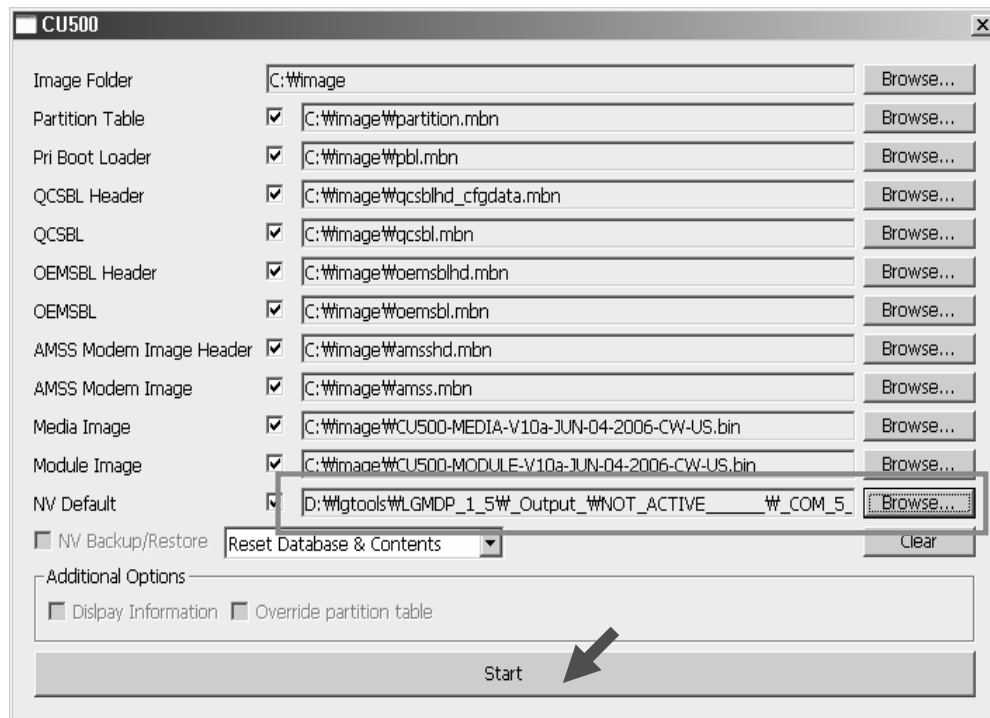
→ Select the proper file and click on 'Restore'.

→ If you want image download and NV backup file restore at once, use the NV Default function.

5.4 Caution

1) Multi-downloading using the USB hub is not recommendable.

2) If you see the message 'cal mode' after 'completing download', you must do NV restore and image (media and module) download.

3) In emergency mode, you can not download the media and module image. So if you want download media and module image, connect the phone normal mode after emergency mode download, and then you can do it.

4) The NV data saved at LGMDP folder like this.

D:\LGMDP\004400-01-429926_COM17

LGMDP folder name

IMEI number

Port number
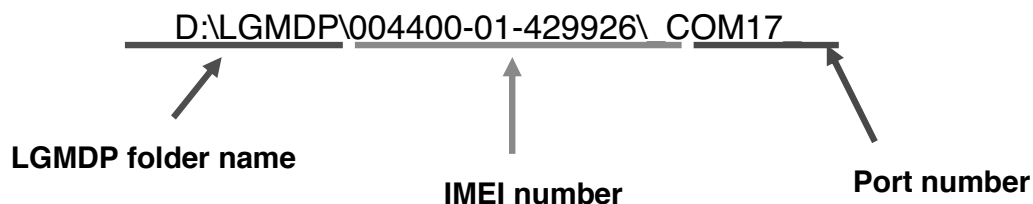
5) Recommended that the Module and Media Image have to be downloaded at the same time.

6) Erase EFS option will erase everything (media, module, nv items, and user data) in the EFS area.

6. BLOCK DIAGRAM

6.1 GSM & UMTS RF Block

Fig 6.1-1.UMTS-850,1900+GSM-850/GSM-900/DCS-1800/PCS-1900 RF Functional Block Diagram

6. BLOCK DIAGRAM

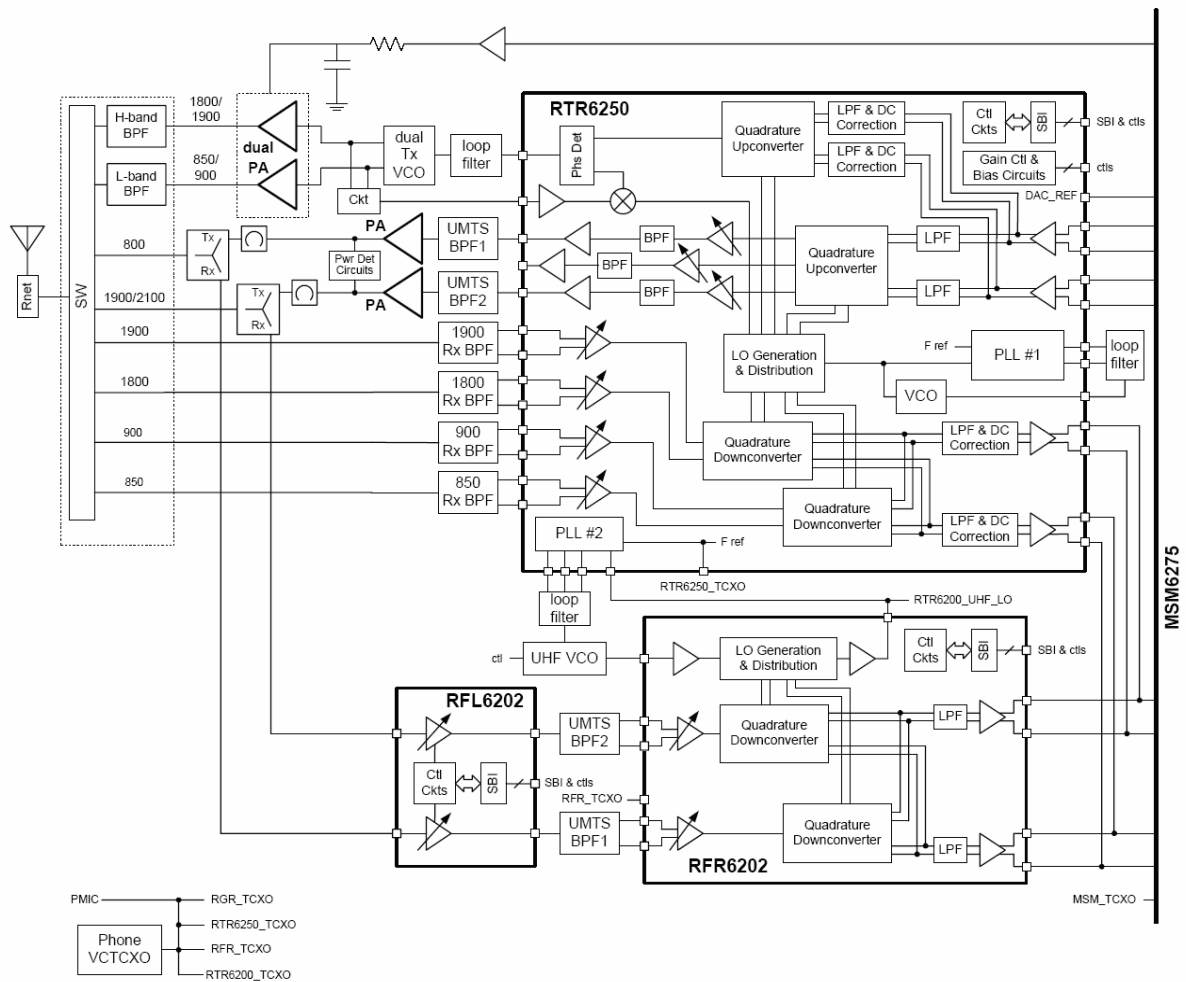| Block Diagram Block	Ref. Name	Part Name	Function	Comment
Common	U101	RTR6250	UMTS/GSM Transceiver	TRX
	X100	MQW541A1G44	VCO for UMTS RX and GSM Calibration.	RX, Calibration
	U100	CXG1198AEQ	Switch	Band select
	SW100	KMS-507	Test Connector	Calibration, etc
	X102	TG-5001LA-19.2MHz	VCTCXO	19.2MHz
Bluetooth	M1	RB06A	Bluetooth RF Transceiver	Bluetooth TRX
	ANT101	ACS2450HBAM6	Antenna	Bluetooth antenna
UMTS	U108	RFR6202	UMTS Receiver IC	RX
	U109	RFL6202	UMTS RX LNA IC	RX
	FL110	B7847	UMTS1900 RX SAW filter	RX
	FL109	B7838	UMTS850 RX SAW filter	RX
	FL107	B7637	UMTS 850 Duplexer	TRX
	FL106	ACMD-7402	UMTS 1900 Duplexer	TRX
	U105	RF5144	UMTS dual PA	TX
	U104	HHM2221SA3	UMTS 850 coupler	TX
	X100	MQW541A1G44	UMTS VCO	RX
	U107	LMV232TLX	UMTS HDET	Power dector
	FL105	B9014	UMTS 1900 TX SAW Filter	TX
	FL108	B9003	UMTS 850 TX SAW Filter	TX
GSM	U102	AND0041	TX Dual PAM	TX
	X101	MQW5V0C869M	VCO	Dual TX VCO
	FL100	B7845	RX SAW Filter	GSM850 RX
	FL101	B7851	RX SAW Filter	PCS RX
	FL102	B7844	RX SAW Filter	GSM900 RX
	FL103	B7837	RX SAW Filter	DCS RX

Table 6.1-1. RF Block Component

6.2 Interface Diagram
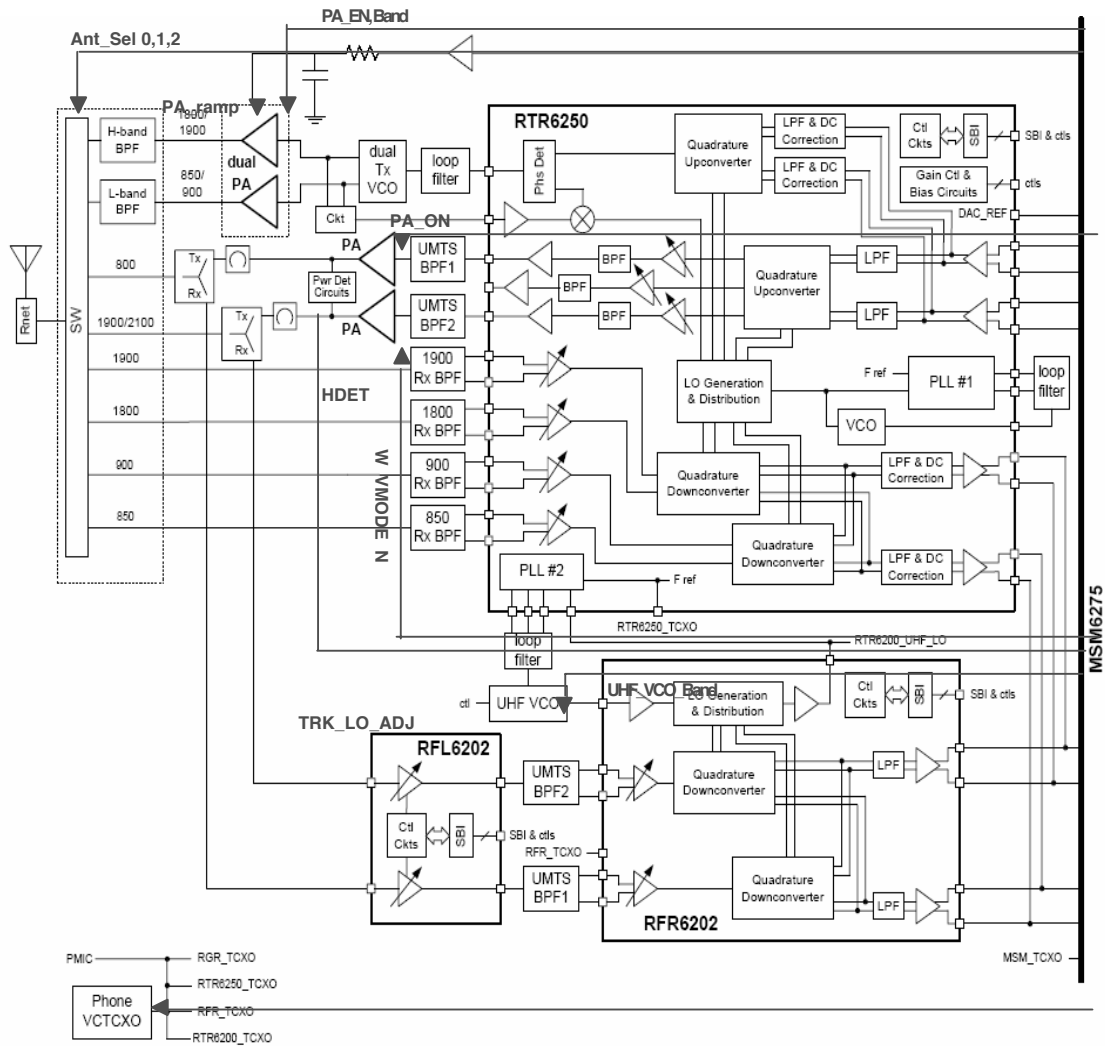
CU500 Interface Diagram

6. BLOCK DIAGRAM

Main RF signal

GSM850 TX : GSM850 Tx RF signal
GSM850 RX : GSM850 Rx RF signal
GSM900 TX : GSM900 Tx RF signal
GSM900 RX : GSM900 Rx RF signal
DCS TX : DCS Tx RF signal
DCS RX : DCS Rx RF signal
PCS TX : PCS Tx RF signal
PCS RX : PCS Rx RF signal
UMTS 850 TX : UMTS 850 Tx RF signal
UMTS 850 RX : UMTS 850 Rx RF signal
UMTS 1900 TX : UMTS 1900 Tx RF signal
UMTS 1900 RX : UMTS 1900 Rx RF signal
TX_I/Q : I/Q for Tx of RF
RX_I/Q : I/Q for Rx of RF

Control signal(red)

ANT_SEL 0,1,2 : Ant Switch Module Mode Selection
                (UMTS, GSM850/GSM900 Tx/Rx, DCS Tx/Rx, PCS Tx/Rx)
GSM PA_CTL signal
   GSM_PA_BAND : DCS or PCS /GSM Mode Selection
   GSM_PA_EN : Power Amp Gain Control Enable
   GSM_PA_RAMP : Power Amp Gain Control
GSM/DCS_VCO_EN
   GSM_VCO_EN : GSM band Tx VCO Enable
   DCS_VCO_EN : DCS band Tx VCO Enable
UMTS PA_CTL signal
   PA_ON : UMTS Tx Power Amp Enable
   TX_AGC_ADJ(VCONTROL) : UMTS Tx Power Amp Gain Control
   W_VMODE_N : Switch to the Low Power mode
   TRK_LO_ADJ : TCXO(19.2M) Control
   UHF_VCO_BAND : UMTS(3G)/GSM(2G) VCO Band Selection of UHF VCO

*Top Side

*Bottom Side

7. CIRCUIT DIAGRAM

7. CIRCUIT DIAGRAM

7. CIRCUIT DIAGRAM

Section	Date	Sign & Name	MODEL	CU500	Sheet/Sheets
Designer	10/31 2005	SH NAM			3/6
Checked			DRAWING NAME	AUDIO/MEMORY	
Approved					
LG Electronics Inc.			DRAWING NO.	MAIN_1.2	

7. CIRCUIT DIAGRAM

7. CIRCUIT DIAGRAM

7. Circuit Diagram

7. Circuit Diagram

DAUGHTER B-TO-B

VREG_T-FLASH_3.0V

S100
500873-0802

GND
DAT2_RSV
CD_DAT3_CS
CMD_DI
VDD
CLK_SCLK
VSS
DAT0_DO
DAT1_RSV
GND

MMC_CD
MMC_CMD
MMC_CLK
MMC_DATA

C103
0.1uF

R101
390K

U102

MMC_DATA
MMC_CLK
VREG_T-FLASH_3.0V
MMC_CD
MMC_CMD

RCLAMP0504F

CN100

HPH_L
HPH_R

VREG_T-FLASH_3.0V

VREG_MSMP_2.7V

MIC2P
MIC2N

MMC_CMD
MMC_CLK
MMC_DATA
MMC_CD

VBACK_UP
EAR_SENSE_N
TTY_ADC_DET
HOOK_SENSE_N

AXK834145YG

10p C109
BAT100
ML41-IRH-F3CE

VBACK_UP

U100

UCLAMP0505A

CON100

R200 33u C102
100

C106
2200p

MIC_JACK

MIC2P

R201 33u C104
100

KJA-PH-3-0059

C108 C107
39p   39p

VREG_MSMP_2.7V

HPH_R

MIC_JACK
HPH_L

R109
100K

EAR_SENSE_N
Pull-down

C118

C105
2200p

MIC2N

R106
2.2K

C117

R100
2.2K

C100
10u
Icc_2125h1_2_r

VREG_MSMP_2.7V

C101
0.1u

R102
1M

VREG_MSMP_2.7V

TTY_ADC_DET

R107 0

HOOK_SENSE_N
Pull-down

R103
330K

U101
NCS2200SQ2T2G

Section	Date	Sign & Name	MODEL	CU500	Sheet/Sheets
Designer	09/22 2005	SH NAM			1/1
Checked			DRAWING NAME	SUB BiD	
Approved					
LG Electronics Inc.			DRAWING NO.	SUB_1.1	

8. pcb layout

8. pcb layout

8. pcb layout

R106 R103 R102
R107 C105 C101
C106
C118
R104
R105
C103

C107
C108
R101

U100

CN100
I7 I8
I3 I4

CU500-SPJY0020701-1.1 TOP

8. pcb layout

CU500-SPJY0020701-1.1 BTM

9. CALIBRATION

9.1 HOT KIMCHI

9.1.1 Directory structure

```
HOT KIMCHI PROJECT ──┬── Auto_Model ──── CU500 ──┬── AutoSetup.xml
                     │                           ├── Procedure_CU500_Ver0.99.xml
                     │                           └── Spec_CU500_Ver0.95.xml
                     │
                     ├── Cal_Model ───── CU500 ──┬── Main_SequenceD.dll
                     │                           ├── Dll_SerialATD.dll
                     ├── HOT_KIMCHI ──┬── CmMqDll.dll          ├── DLL_PwrControlD.dll
                     │                ├── ComLMPLib_06.dll     ├── DLL_E5515CD.DLL
                     │                ├── Hot_KimchiD.exe      ├── AT_Serial_Cmd.xml
                     │                └── ShieldBox_DllD.dll   ├── PwrSupply_Cmd.xml
                     ├── RF_Auto ─────┬── Main_SequenceD.dll   ├── Setup_Cal_Test.xml
                     └── Info_Db.txt  ├── Dll_SerialATD.dll    └── Jay_Ver0.8A_CU500.dll
                                      ├── DLL_PwrControlD.dll
                                      ├── DLL_E5515CD.DLL
                                      ├── AT_Serial_Cmd.xml
                                      ├── PwrSupply_Cmd.xml
                                      ├── Rf_AutoMain_Ver1114.dll
                                      └── Setup_RF_AutoTest.xml
```

☐ : Directory

☐ : File

9. CALIBRATION

9.1.2 Setup file (Info_Db.txt)

   ①   ②   ③

/*cal*/[Default]=[CU500]

/*cal*/[CU500]=[..\\Cal_Model\\CU500\\Jay_Ver0.8A_CU500.dll]

   ④

/*auto*/[CU500]=[..\\RF_Auto\\Rf_AutoMain_Ver1114.dll]

   ⑤

[ezlooks]=[off]
[batcal]=[off]
[svc]=[off]
[standalone]=[off]
[tescom]=[off]

   ⑥   ⑦

[process]=[cal]

**[CU500]=[..\\Auto_Model\\CU500\\Procedure_CU500_Ver0.99.xml,..\\Auto_Model\\CU500\\Spec_
     CU500_Ver0.95.xml,..\\Auto_Model\\CU500\\AutoSetup.xml]**

1: Indication of 'cal process' or 'auto process'

2: Model name which is displayed on Hot Kimchi program

3: Relative path of Main Sequence dll file from Hot_KimchiD.exe

4: You can change this as 'on' or 'off'(should be in lower case; on, off)

5: You can change this as 'auto' or 'cal'(should be in lower case; on, off)

6: Auto model name

7: Relative path of auto model procedure, spec, setting file from Hot_KimchiD.exe

- 155 -

9.1.3 Setup file item

[ezlooks]=> If you use ezlooks, turn it on
        Domestic: 'on', Oversea: 'off'

[batcal]=> Battery calibration on/off

[svc]=> If you use this program in svc, turn it on.
      Domestic: 'on', Oversea:'off'

[standalone]=> Oversea factory or SVC: 'on', Domestic factory: 'off'

[tescom]=> If you use TESCOM shiedbox, turn it on.

[process]=> auto process or cal process

[CU500]=> procedure, spec, setup file name(auto process only)

9. CALIBRATION

9.1.4 Example for setting file

CAL Process	AUTO Process
Ex1) Service center 　　　　　[ezlooks]=[off] 　　　　　[batcal]=[off] 　　　　　[svc]=[on] 　　　　　[standalone]=[off] 　　　　　[tescom]=[off] 　　　　　[process]=[cal] **Ex2) Oversea factory or repair** 　　　　　[ezlooks]=[off] 　　　　　[batcal]=[on] 　　　　　[svc]=[off] 　　　　　[standalone]=[on] 　　　　　[tescom]=[off] 　　　　　[process]=[cal] **Ex3) Domestic factory** 　　　　　[ezlooks]=[on] 　　　　　[batcal]=[on] 　　　　　[svc]=[off] 　　　　　[standalone]=[off] 　　　　　[tescom]=[off] 　　　　　[process]=[cal]	**Ex1) Service center, Oversea factory, repair** 　　　　　[ezlooks]=[off] 　　　　　[batcal]=[off] 　　　　　[svc]=[off] 　　　　　[standalone]=[off] 　　　　　[tescom]=[off] 　　　　　[process]=[auto] **Ex2) Domestic factory** 　　　　　[ezlooks]=[on] 　　　　　[batcal]=[off] 　　　　　[svc]=[off] 　　　　　[standalone]=[off] 　　　　　[tescom]=[off] 　　　　　[process]=[auto] ***.If Tescom S/B is used, it should be [tescom]=[on].**

9.2 How to use Hot Kimchi
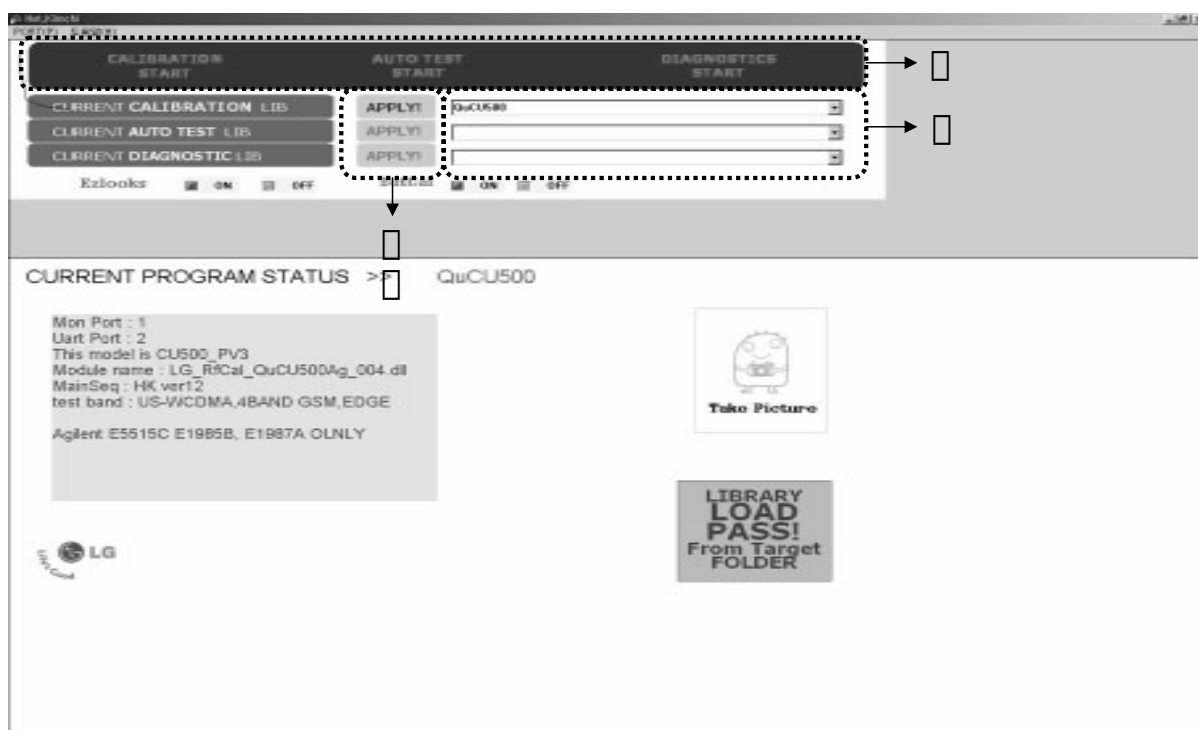
* Flow

1. Select the model name which you want

2. Click APPLY button to load the 'cal' or 'auto' lib file

3. Click START button to run the procedure which you want

9.3 HOT KIMCHI Example

Choose Exe_Cu500Ag_100

Click APPLY button

Click START button

10.1 EXPLODED VIEW

COVER ASSY FOLDER UPPER

COVER ASSY FOLDER LOWER

PLATE ASSY

COVER ASSY FOLDER

COVER ASSY FRONT

COVER ASSY REAR

PHONE ASSY

COVER ASSY CAMERA FRONT

COVER ASSY CAMERA

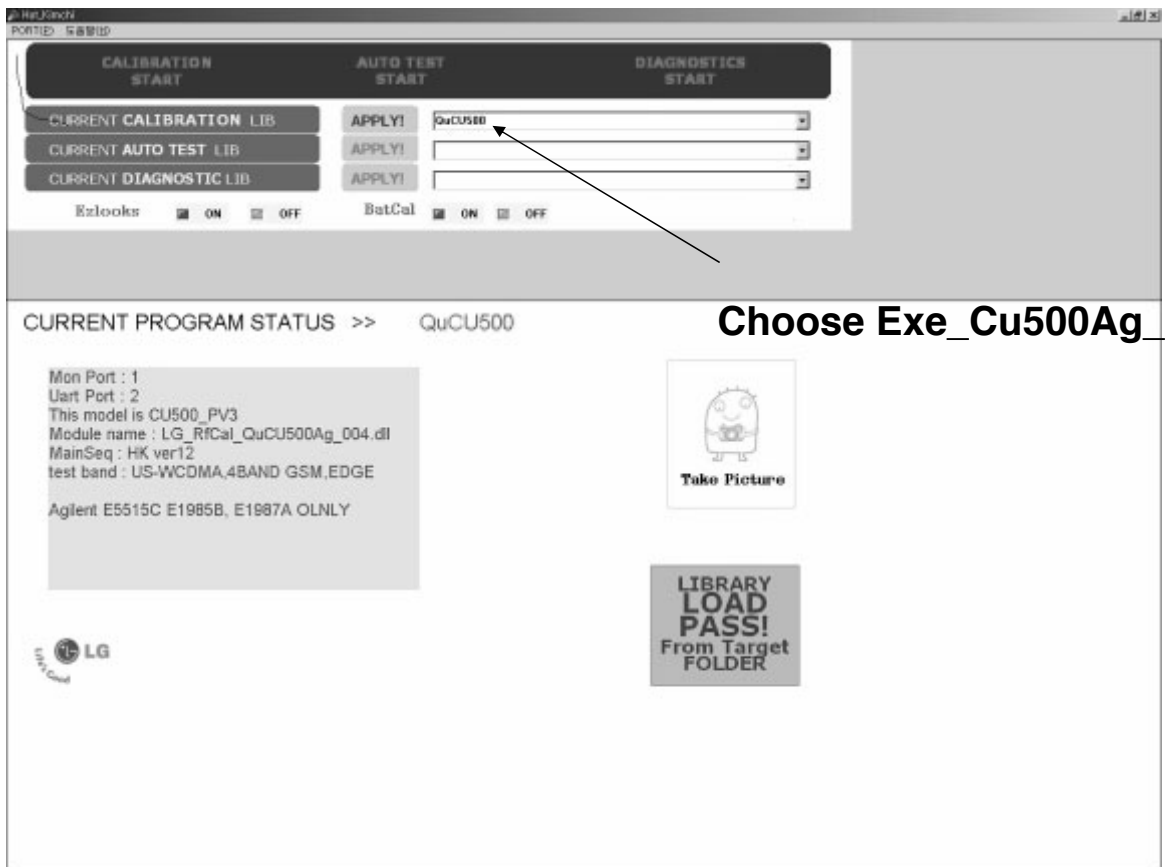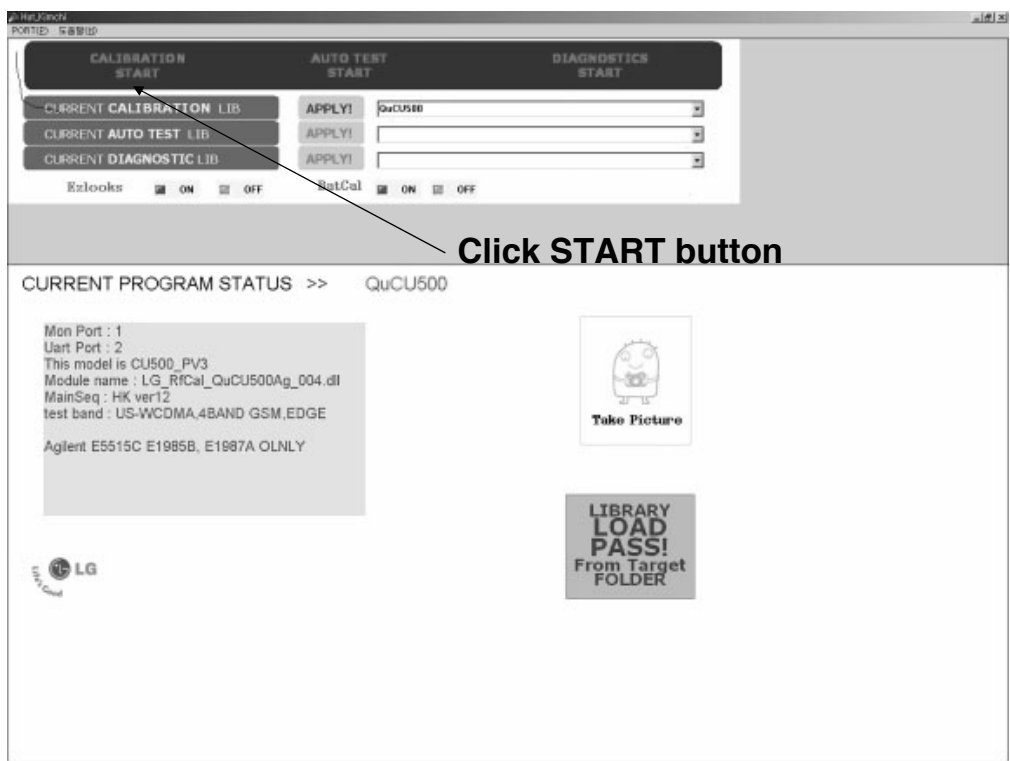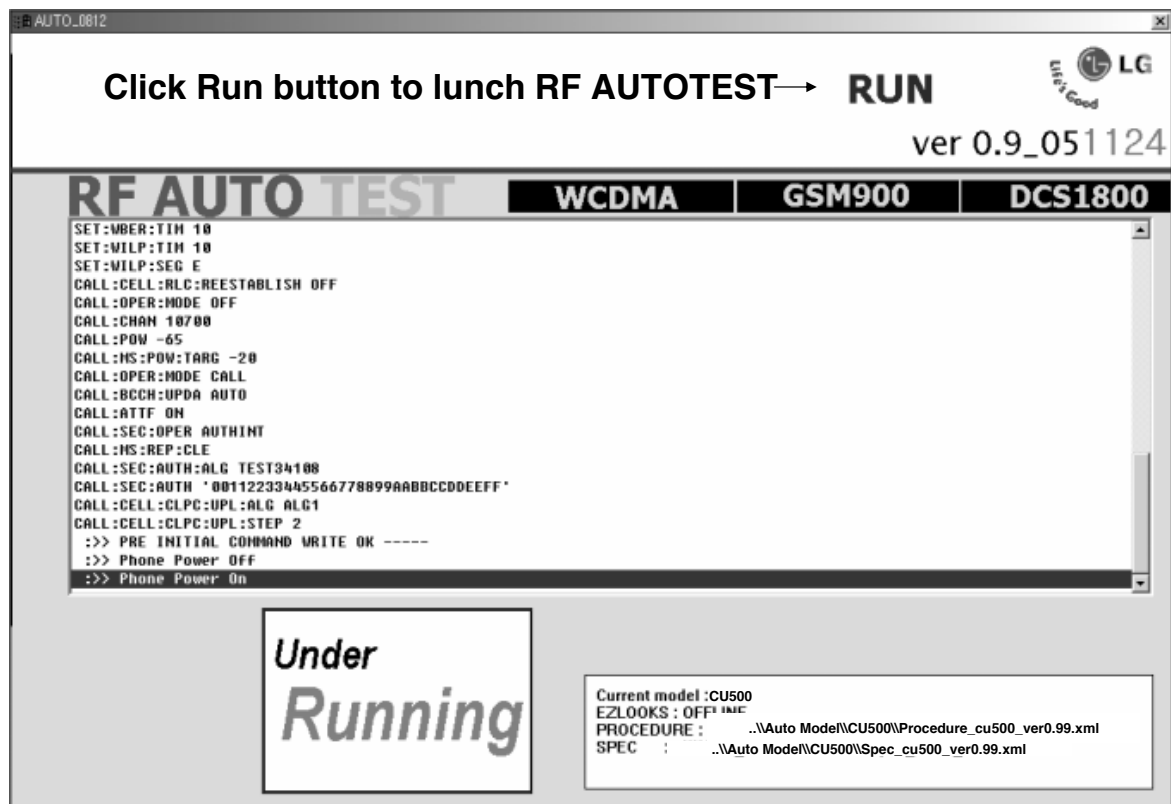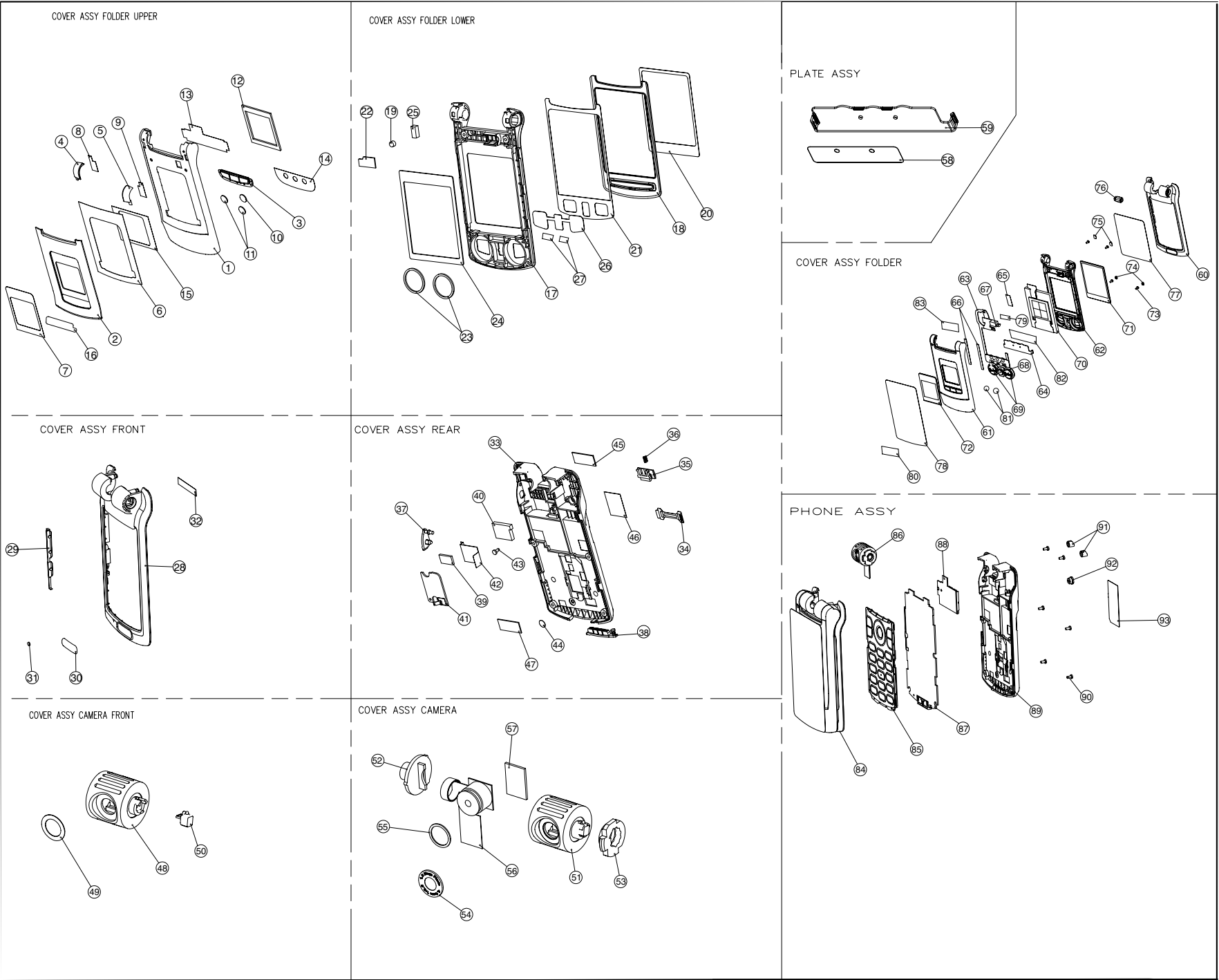| 47	PAD REAR	1	MPBZ0141101
46	LABEL_MINISD	1	MLAZ0044301
45	LABEL,QUALCOMM	1	MLAN0000603
44	A/S LABEL	1	MLAB0001102
43	TAPPING TAPTITE	1	GGZZ0004001
42	TAPE SHIELD _Rear	1	MTAC0034501
41	ANTENNA	1	SNGF0013101
40	PAD_MIDDLE_REAR	1	MPBZ0114301
39	PAD_LEFT_REAR	1	MPBZ0114201
38	CAP,RECEPTACLE	1	MCCE0024701
37	CAP,EARPHONE JACK	1	MCCC0031201
36	SPRING,LOCKER	1	MSDC0008301
35	LOCKER,BATTERY	1	MLEA0027701
34	LOCKER,SIM	1	MLEY0000801
33	COVER,REAR	1	MCJN0047101
32	TAPE SHILED	1	MTAC0036301
31	PAD,MIKE	1	MPBH0018801
30	STOPPER	1	MSGY0016001
29	BUTTON,SIDE	1	MBJL0029401
28	COVER,FRONT	1	MCJK0058101
27	TAPE	2	MTAZ0122401
26	FILTER,SPK	1	MFBC0022801
25	GASKET,SHIELD FORM	1	MGAD0112401
24	PAD,LCD	1	MPBG0039701
23	PAD	2	MPBN0026201
22	PAD	1	MPBZ0113401
21	TAPE,DECO_Lower	1	MTAA0100701
20	TAPE,WINDOW	1	MTAD0044401
19	MAGNET	1	MMAA0001601
18	DECO,FOLDER(LOWER)	1	MDAF0008201
17	COVER,FOLDER(LOWER)	1	MCJH0032101
16	TAPE PROTECTION	1	MTAB0122301
15	TAPE,SHIELD	1	MTAC0036801
14	INSULATOR MOD_KEY	1	MIDZ0089501
13	INSULATOR_UPPER	1	MIDZ0095001
12	PAD,LCD(SUB)	1	MPBQ0025501
11	PAD SPEAKE	2	MPBN0025101
10	PAD,RECEIVER	1	MPBM0011201
9	TAPE,DECO_Side(Right)	1	MTAA0100601
8	TAPE,DECO_Side(Left)	1	MTAA0100501
7	TAPE,WINDOW(SUB)	1	MTAE0025201
6	TAPE,DECO_Folder Upper	1	MTAA0100401
5	DECO,SIDE_Right	1	MDAC0016001
4	DECO,SIDE_Left	1	MDAC0015901
3	BUTTON ASSY,FUNCTION	1	ABGB0003101
2	DECO FOLDER (UPPER)	1	MDAE0033901
1	COVER,FOLDER(UPPER)	1	MCJJ0039501

93	LABEL,MODEL	1	MLAK0006901
92	CAP,SCREW_MOBILE_SWTCH	1	MCCH0031101
91	CAP,SCREW	2	MCCH0070701
90	SCREW MACHINE,BIND	6	GMEY0011201
89	COVER ASSY,REAR	1	ACGM0064601
88	PCB ASSY,SUB	1	SAJY0015801
87	PCB ASSY,MAIN	1	SAFY0154801
86	COVER ASSY,CAMERA	1	ACGN0005201
85	BUTTON ASSY,DIAL	1	ABGA0005801
84	COVER ASSY,FOLDER	1	ACGG0067501
83	INSULAIOR	1	MIDZ0095301
82	INSULAIOR	1	MIDZ0095201
81	INSULAIOR	2	MIDZ0095101
80	LABEL,BARCODE	1	MLAC0003401
79	TAPE	1	MTAZ0128501
78	TAPE,PROTECTION	1	MTAB0103501
77	TAPE,PROTECTION	1	MTAB0103602
76	HINGE,FOLDER	1	MHFD0012901
75	CAP,SCREW	2	MCCH0070601
74	CAP,SCREW	2	MCCH0070501
73	SCREW MACHINE,BIND	4	GMEY0011201
72	WINDOW,LCD(SUB)	1	MWAF0031001
71	WINDOW,LCD	1	MWAC0061201
70	LCD	1	SVLM0013102
69	SPEAKER	2	SUSY0019401
68	RECEIVER	1	SURY0009501
67	VIBRATOR	1	SJMY0007002
66	GASKET,SHIELD FORM	2	MGAD0112301
65	TAPE SHIELD	1	MTAC0034601
64	PLATE ASSY	1	APGZ0001701
63	PCB ASSY,FLEXIBLE_LCD	1	SPCY0067301
62	COVER ASSY,FOLDER(LOWER)	1	ACGH0039501
61	COVER ASSY,FOLDER(UPPER)	1	ACGJ0051501
60	COVER ASSY,FRONT	1	ACGK0063501
59	PLATE	1	MPFZ0022401
58	TAPE	1	MTAZ0097501
57	PAD	1	MPBZ0123901
56	CAMERA	1	SVCY0009401
55	PAD,CAMERA	1	MPBT0022901
54	WINDOW,CAMERA	1	MWAE0013301
53	BUSHING,CAMERA(LEFT)	1	MBIC0001701
52	CAP,CAMERA	1	MCCK0003801
51	COVER ASSY,CAMERA(FRONT)	1	ACGP0003401
50	TERMINAL ASSY	1	ATBZ0001301
49	TAPE,WINDOW	1	MTAD0037901
48	COVER,CAMERA(FRONT)	1	MCJP0005001

10.2 Replacement Parts <Mechanic component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Specification	Color	Remark
1		IMT,FOLDER	TIFF0010801			
2	AAAY00	ADDITION	AAAY0143101		Black	
3	MPBZ00	PAD	MPBZ0146501	BOX, SW, , , , ,		
2	APEY01I	PHONE	APEY0255901		Black	
3	ABGA00	BUTTON ASSY,DIAL	ABGA0005801		Orange	85
3	ACGG00I	COVER ASSY,FOLDER	ACGG0067501		Black	84
4	ACGH00I	COVER ASSY, FOLDER(LOWER)	ACGH0039501		Black	62
5	MCJH00I	COVER,FOLDER(LOWER)	MCJH0032101	MOLD, PPA VERTON PDX-U-03320, , , , ,	Black	17
5	MDAF00I	DECO,FOLDER(LOWER)	MDAF0008201		Black	18
5	MFBC00	FILTER,SPEAKER	MFBC0022801			26
5	MGAD00	GASKET,SHIELD FORM	MGAD0112401		Gold	25
5	MMAA00	MAGNET,SWITCH	MMAA0001601	7100 magnetic	Silver	19
5	MPBG00I	PAD,LCD	MPBG0039701		Black	24
5	MPBN00	PAD,SPEAKER	MPBN0026201	COMPLEX, (empty), , , , ,	Black	23
5	MPBZ00	PAD	MPBZ0113401	COMPLEX, (empty), , , , ,	Dark Blue	22
5	MTAA00	TAPE,DECO	MTAA0100701	COMPLEX, (empty), , , , ,		21
5	MTAD00	TAPE,WINDOW	MTAD0044401			20
5	MTAZ00	TAPE	MTAZ0122401			27
4	ACGJ00I	COVER ASSY, FOLDER(UPPER)	ACGJ0051501		Black	61
5	ABGB00	BUTTON ASSY,FUNCTION	ABGB0003101		Orange	3
5	MCJJ00I	COVER,FOLDER(UPPER)	MCJJ0039501	MOLD, PC LUPOY SC-1004A, , , , ,	Black	1
5	MDAC00	DECO,SIDE	MDAC0015901	MOLD, PC LUPOY SC-1004A, , , , ,	Black	4
5	MDAC01	DECO,SIDE	MDAC0016001	MOLD, PC LUPOY SC-1004A, , , , ,	Black	5
5	MDAE00I	DECO,FOLDER(UPPER)	MDAE0033901		Black	2
5	MICA00	INSERT,FRONT	MICA0020401	M1.4*2mm(Phi2.4)		
5	MIDZ00	INSULATOR	MIDZ0089501	COMPLEX, (empty), , , , ,		14
5	MIDZ01	INSULATOR	MIDZ0095001			13
5	MPBM00	PAD,RECEIVER	MPBM0011201		Black	10
5	MPBN00	PAD,SPEAKER	MPBN0025101		Black	11
5	MPBQ00	PAD,LCD(SUB)	MPBQ0025501		Black	12
5	MTAA00	TAPE,DECO	MTAA0100401	COMPLEX, (empty), , , , ,		6
5	MTAA01	TAPE,DECO	MTAA0100601			9

10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	MTAA02	TAPE,DECO	MTAA0100501			8
5	MTAB00	TAPE,PROTECTION	MTAB0122301	COMPLEX, (empty), , , , ,		16
5	MTAC00	TAPE,SHIELD	MTAC0036801		Gold	15
5	MTAE00	TAPE,WINDOW(SUB)	MTAE0025201	COMPLEX, (empty), , , , ,		7
4	ACGK00I	COVER ASSY,FRONT	ACGK0063501		Black	60
5	MBJL00	BUTTON,SIDE	MBJL0029401	COMPLEX, (empty), , , , ,	Black	29
5	MCJK00	COVER,FRONT	MCJK0058101	MOLD, PC LUPOY SC-1004A, , , , ,	Black	28
5	MICA00	INSERT,FRONT	MICA0020501	COMPLEX, (empty), , , , ,		
5	MICA01	INSERT,FRONT	MICA0020601	COMPLEX, (empty), , , , ,		
5	MPBH00	PAD,MIKE	MPBH0018801	COMPLEX, (empty), , , , ,		31
5	MSGY00	STOPPER	MSGY0016001	COMPLEX, (empty), , , , ,		30
5	MTAC00	TAPE,SHIELD	MTAC0036301		Gold	32
4	APGZ00	PLATE ASSY	APGZ0001701			64
5	MIDZ00	INSULATOR	MIDZ0095301			83
5	MPFZ00	PLATE	MPFZ0022401	PRESS, STS, , , , ,		59
5	MTAZ00	TAPE	MTAZ0097501	COMPLEX, (empty), , , , ,		58
4	GMEY00	SCREW MACHINE,BIND	GMEY0011201	1.4 mm,3 mm,MSWR3(BK) ,N ,+ ,NYLOK		
4	MCCH00	CAP,SCREW	MCCH0070501		Black	74
4	MCCH01	CAP,SCREW	MCCH0070601		Black	75
4	MGAD01	GASKET,SHIELD FORM	MGAD0112301		Gold	66
4	MHFD00	HINGE,FOLDER	MHFD0012901	Phi6.0 * 10.3mm		
4	MIDZ00	INSULATOR	MIDZ0056801			
4	MIDZ01	INSULATOR	MIDZ0095201			82
4	MIDZ02	INSULATOR	MIDZ0095101			81
4	MLAC00	LABEL,BARCODE	MLAC0003401	EZ LOOKS(user for mechanical)		80
4	MTAB00	TAPE,PROTECTION	MTAB0103501	COMPLEX, (empty), , , , ,		75
4	MTAB01	TAPE,PROTECTION	MTAB0103602	CUTTING, Silicone Rubber, , , , ,		77
4	MTAC00	TAPE,SHIELD	MTAC0034601		Gold	65
4	MTAZ00	TAPE	MTAZ0128501	COMPLEX, (empty), , , , ,		79
4	MWAC00I	WINDOW,LCD	MWAC0061201		Black	71
4	MWAF01I	WINDOW,LCD(SUB)	MWAF0031001		Black	72
6	ADCA00	DOME ASSY,METAL	ADCA0053301	MOD Key	Black	
3	ACGM00I	COVER ASSY,REAR	ACGM0064601		Black	89
4	GGZZ00	SCREW TAPPING	GGZZ0004001	GROUND_SCREW		43
4	MCCC00	CAP,EARPHONE JACK	MCCC0031201		Black	37
4	MCCE00	CAP,RECEPTACLE	MCCE0024701	COMPLEX, (empty), , , , ,	Black	38
4	MCJN00	COVER,REAR	MCJN0047101	MOLD, PC LUPOY SC-1004A, , , , ,	Black	33

Level	Location No.	Description	Part Number	Specification	Color	Remark
4	MGAZ00	GASKET	MGAZ0040301	COMPLEX, (empty), , , , ,		
4	MLAB00	LABEL,A/S	MLAB0001102	C2000 USASV DIA 4.0	White	44
4	MLAN00	LABEL,QUALCOMM	MLAN0000603	White,95C	Transparent	45
4	MLAZ00	LABEL	MLAZ0044301	PRINTING, (empty), , , , ,		46
4	MLEA00	LOCKER,BATTERY	MLEA0027701		Black	35
4	MLEY00	LOCKER	MLEY0000801	SIM LOCKER	Silver	34
4	MPBZ00	PAD	MPBZ0114201	COMPLEX, (empty), , , , ,		39
4	MPBZ01	PAD	MPBZ0114301	COMPLEX, (empty), , , , ,		40
4	MPBZ03	PAD	MPBZ0141101	COMPLEX, (empty), , , , ,		47
4	MSDC00	SPRING,LOCKER	MSDC0008301			36
4	MTAC00	TAPE,SHIELD	MTAC0034501	COMPLEX, (empty), , , , ,	Gold	42
3	ACGN00I	COVER ASSY,CAMERA	ACGN0005201		Black	86
4	ACGP00	COVER ASSY, CAMERA(FRONT)	ACGP0003401			51
5	ATBZ00	TERMINAL ASSY	ATBZ0001301		Black	50
5	MCJP00I	COVER,CAMERA(FRONT)	MCJP0005001		Black	48
5	MTAD00	TAPE,WINDOW	MTAD0048101	COMPLEX, (empty), , , , ,		
4	MBIC00I	BUSHING,CAMERA(LEFT)	MBIC0001701	MOLD, POM TX-31, , , , ,		53
4	MCCK00I	CAP,CAMERA	MCCK0003801	MOLD, PC LUPOY SC-1004A, , , , ,		52
4	MPBT00I	PAD,CAMERA	MPBT0022901	COMPLEX, (empty), , , , ,		55
4	MPBZ00	PAD	MPBZ0123901	COMPLEX, (empty), , , , ,		57
4	MWAE00	WINDOW,CAMERA	MWAE0013301	CUTTING, PMMA MR 200, , , , ,		54
3	MCCF00	CAP,MOBILE SWITCH	MCCF0031101	COMPLEX, (empty), , , , ,		92
3	MCCH00	CAP,SCREW	MCCH0070701		Black	91
3	MLAK00	LABEL,MODEL	MLAK0006901			93
5	ADCA00	DOME ASSY,METAL	ADCA0045201			
5	MLAB00	LABEL,A/S	MLAB0001103	C2000 CGRSV	White	
5	MLAC00	LABEL,BARCODE	MLAC0003301	EZ LOOKS(use for PCB ASSY MAIN(hardware))		

10.2 Replacement Parts <Main component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Specification	Color	Remark
4	SACY00	PCB ASSY,FLEXIBLE	SACY0044301			
5	SACB00	PCB ASSY, FLEXIBLE,INSERT	SACB0028901			
5	SACE00	PCB ASSY,FLEXIBLE,SMT	SACE0039101			
6	SACC00	PCB ASSY,FLEXIBLE,SMT BOTTOM	SACC0022201			
7	ENBY00	CONNECTOR, BOARD TO BOARD	ENBY0028901	50 PIN,0.4 mm,ETC , ,H=1.5, P4S Socket		
6	SACD00	PCB ASSY,FLEXIBLE,SMT TOP	SACD0031701			
7	ENBY00	CONNECTOR, BOARD TO BOARD	ENBY0028501	40 PIN,0.4 mm,ETC , ,H=1.5, P4S Socket		
7	ERHY00	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
7	SEVY00	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	SPCY00	PCB,FLEXIBLE	SPCY0067301	POLYI ,0.4 mm,MULTI-4 ,		63
4	SJMY00	VIBRATOR,MOTOR	SJMY0007002	3.0 V,0.8 A,4*12.1*5T ,F1100,SILINDER,WIRE 12mm		67
4	SURY00	RECEIVER	SURY0009501	ASSY ,107 dB,32 ohm,11*07 ,3T		68
4	SUSY00	SPEAKER	SUSY0020601	ASSY ,8 ohm,89 dB,15 mm,3.7T		69
4	SVLM00	LCD MODULE	SVLM0013102	MAIN ,2.0(176*220)_1.17"(96*96) ,39.0*60.2*4.0 ,262k ,TFT ,TM ,HD66784R(AIO) ,Main_TFT Sub_TFT		
4	SNGF00	ANTENNA,GSM,FIXED	SNGF0013101	5.0:1 ,0 dBd, ,GSM850/EGSM/DCS/PCS/WCDMA800/WCDMA1900, INTERNAL, Fb-Free		41
4	SVCY00	CAMERA	SVCY0009401	CMOS ,MEGA ,1.3M OVT(OV9655) 1/4", 8*8*6.27t, FPCB		56
3	GMEY00	SCREW MACHINE,BIND	GMEY0011201	1.4 mm,3 mm,MSWR3(BK) ,N ,+ ,NYLOK		73,90
3	SAFY00	PCB ASSY,MAIN	SAFY0154801			87
4	SAFB00	PCB ASSY,MAIN,INSERT	SAFB0056801			
5	SPKY00	PCB,SIDEKEY	SPKY0027901	POLYI ,0.2 mm,DOUBLE ,		
4	SAFF00	PCB ASSY,MAIN,SMT	SAFF0079901			
5	SAFC00	PCB ASSY,MAIN,SMT BOTTOM	SAFC0058901			
6	ANT101	ANTENNA,GSM,FIXED	SNGF0016101	, dBd, ,bluetooth chip antenna		
6	C100	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1000	CAP,CHIP,MAKER	ECZH0000841	56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1001	CAP,CERAMIC,CHIP	ECCH0000196	0.75 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1002	CAP,CERAMIC,CHIP	ECCH0000187	150 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1004	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1005	CAP,CERAMIC,CHIP	ECCH0000187	150 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C1006	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1007	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1008	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1009	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C101	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1010	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1011	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1012	CAP,CERAMIC,CHIP	ECCH0000187	150 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1013	CAP,CERAMIC,CHIP	ECCH0000187	150 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1014	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1015	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1016	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1017	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1018	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1019	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C102	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1020	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1021	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1022	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1023	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1024	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1025	CAP,TANTAL,CHIP	ECTH0003703	4.7 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C1027	CAP,CHIP,MAKER	ECZH0001126	820 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C1028	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1029	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C103	CAP,CERAMIC,CHIP	ECCH0000157	15 nF,16V,K,X7R,HD,1005,R/TP		
6	C1030	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1031	CAP,FILM,MPP	ECFD0000201	10000 pF,16V ,J ,NI ,SMD ,20121.1 mm,R/TP		
6	C1032	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C1033	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1034	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1035	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1036	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1037	CAP,CERAMIC,CHIP	ECCH0000138	390 pF,50V,K,X7R,HD,1005,R/TP		
6	C1038	CAP,CHIP,MAKER	ECZH0000844	68 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1039	CAP,CERAMIC,CHIP	ECCH0000129	120 pF,50V,J,NP0,TC,1005,R/TP		
6	C104	CAP,CERAMIC,CHIP	ECCH0000157	15 nF,16V,K,X7R,HD,1005,R/TP		

10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C1040	CAP,CERAMIC,CHIP	ECCH0000137	330 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C1041	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1042	CAP,FILM,MPP	ECFD0000703	3900 pF,16V ,J ,NI ,SMD ,2012 mm,R/TP		
6	C1043	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1045	CAP,FILM,MPP	ECFD0000614	5.6 nF,16V ,J ,NI ,SMD ,2012 mm,R/TP		
6	C1046	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1047	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1048	CAP,CERAMIC,CHIP	ECCH0000127	82 pF,50V,J,NP0,TC,1005,R/TP		
6	C1049	CAP,CHIP,MAKER	ECZH0000839	4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C105	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1050	CAP,CERAMIC,CHIP	ECCH0000107	6 pF,50V,D,NP0,TC,1005,R/TP		
6	C1051	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1052	CAP,TANTAL,CHIP,MAKER	ECTZ0004204	100 uF,6.3V ,M ,STD ,3216 ,R/TP		
6	C1054	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1055	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1056	CAP,CERAMIC,CHIP	ECCH0000123	51 pF,50V,J,NP0,TC,1005,R/TP		
6	C1058	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1059	CAP,CHIP,MAKER	ECZH0001106	4700 pF,25V ,K ,X7R ,HD ,1005 ,R/TP		
6	C106	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1060	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1061	CAP,TANTAL,CHIP	ECTH0003703	4.7 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C1062	CAP,TANTAL,CHIP	ECTH0003703	4.7 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C1063	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1064	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1065	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C1066	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C107	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1071	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1072	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C1074	CAP,CHIP,MAKER	ECZH0000822	1.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1075	CAP,CHIP,MAKER	ECZH0000841	56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1078	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1079	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C108	CAP,TANTAL,CHIP	ECTH0003703	4.7 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C1080	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1081	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1082	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C1083	CAP,CERAMIC,CHIP	ECCH0000127	82 pF,50V,J,NP0,TC,1005,R/TP		
6	C1084	CAP,CERAMIC,CHIP	ECCH0000127	82 pF,50V,J,NP0,TC,1005,R/TP		
6	C1087	CAP,CERAMIC,CHIP	ECCH0000180	3.3 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1088	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1089	CAP,CHIP,MAKER	ECZH0000816	12 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C109	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1090	CAP,CERAMIC,CHIP	ECCH0000101	.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1091	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1092	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1093	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1094	CAP,CERAMIC,CHIP	ECCH0000147	2.2 nF,50V,K,X7R,HD,1005,R/TP		
6	C1098	CAP,CERAMIC,CHIP	ECCH0000147	2.2 nF,50V,K,X7R,HD,1005,R/TP		
6	C1099	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C110	CAP,TANTAL,CHIP	ECTH0001901	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
6	C1100	CAP,CERAMIC,CHIP	ECCH0000147	2.2 nF,50V,K,X7R,HD,1005,R/TP		
6	C1101	CAP,CERAMIC,CHIP	ECCH0000147	2.2 nF,50V,K,X7R,HD,1005,R/TP		
6	C1102	CAP,TANTAL,CHIP	ECTH0003703	4.7 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C1105	INDUCTOR,CHIP	ELCH0005006	33 nH,J ,1005 ,R/TP ,		
6	C1107	CAP,TANTAL,CHIP	ECTH0003703	4.7 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C1108	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1109	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1110	CAP,CERAMIC,CHIP	ECCH0000145	1.5 nF,50V,K,X7R,HD,1005,R/TP		
6	C1111	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1112	CAP,CERAMIC,CHIP	ECCH0000107	6 pF,50V,D,NP0,TC,1005,R/TP		
6	C1113	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1114	CAP,TANTAL,CHIP	ECTH0003703	4.7 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C1115	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1116	CAP,CERAMIC,CHIP	ECCH0000107	6 pF,50V,D,NP0,TC,1005,R/TP		
6	C1117	CAP,CERAMIC,CHIP	ECCH0000184	2.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1118	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1119	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1120	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1121	CAP,CERAMIC,CHIP	ECCH0000184	2.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1123	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1124	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1125	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1126	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		

10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C1127	CAP,CHIP,MAKER	ECZH0000816	12 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C113	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1130	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1131	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1132	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1133	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1134	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1135	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1136	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1137	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C114	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1140	CAP,CERAMIC,CHIP	ECCH0000165	68 nF,6.3V,K,X5R,HD,1005,R/TP		
6	C1141	CAP,CHIP,MAKER	ECZH0000802	1 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C115	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1150	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C1151	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1152	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP		
6	C1153	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1155	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1156	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1157	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C1158	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C116	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C117	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C118	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C119	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C120	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C121	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C122	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C123	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C124	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C125	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C126	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C127	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C128	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C129	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C130	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C131	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C133	CAP,CERAMIC,CHIP	ECCH0000147	2.2 nF,50V,K,X7R,HD,1005,R/TP		
6	C134	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C135	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C136	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C137	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C138	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C139	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C140	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C141	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C142	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C143	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C144	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1444	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C145	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C146	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C147	CAP,CERAMIC,CHIP	ECCH0000161	33 nF,16V,K,X7R,HD,1005,R/TP		
6	C149	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C1500	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1501	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C1503	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C1507	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1511	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1819	CAP,TANTAL,CHIP	ECTH0001901	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
6	C1820	CAP,TANTAL,CHIP	ECTH0001901	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
6	C1821	CAP,TANTAL,CHIP	ECTH0002701	2.2 uF,10V ,M ,STD ,1608 ,R/TP		
6	C1827	CAP,CERAMIC,CHIP	ECCH0000101	.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1828	CAP,CERAMIC,CHIP	ECCH0000101	.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1829	CAP,CERAMIC,CHIP	ECCH0000101	.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1910	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C1911	CAP,CERAMIC,CHIP	ECCH0000185	5.6 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C1912	CAP,CERAMIC,CHIP	ECCH0000185	5.6 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C200	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C2001	CAP,CERAMIC,CHIP	ECCH0000105	4 pF,50V,C,NP0,TC,1005,R/TP		
6	C201	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C202	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C203	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		

10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C204	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C205	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C206	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C207	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C208	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C209	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C210	CAP,CHIP,MAKER	ECZH0001105	8200 pF,16V ,K ,X7R ,HD ,1005 ,R/TP		
6	C211	CAP,CERAMIC,CHIP	ECCH0000199	12 nF,16V ,K ,X7R ,HD ,1005 ,R/TP		
6	C212	CAP,CERAMIC,CHIP	ECCH0000199	12 nF,16V ,K ,X7R ,HD ,1005 ,R/TP		
6	C213	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C214	CAP,CHIP,MAKER	ECZH0001105	8200 pF,16V ,K ,X7R ,HD ,1005 ,R/TP		
6	C215	CAP,CERAMIC,CHIP	ECCH0000199	12 nF,16V ,K ,X7R ,HD ,1005 ,R/TP		
6	C216	CAP,CERAMIC,CHIP	ECCH0000199	12 nF,16V ,K ,X7R ,HD ,1005 ,R/TP		
6	C217	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
6	C218	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C219	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C222	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C223	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C224	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C288	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C300	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C301	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C302	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C303	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C304	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C305	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C306	CAP,TANTAL,CHIP,MAKER	ECTZ0004203	68 uF,6.3V ,M ,STD ,3216 ,R/TP		
6	C307	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C308	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C309	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C311	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C312	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C313	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP		
6	C314	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP		
6	C315	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP		
6	C316	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C317	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C318	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C319	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C320	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C321	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C322	CAP,CERAMIC,CHIP	ECCH0000113	18 pF,50V,J,NP0,TC,1005,R/TP		
6	C323	CAP,CERAMIC,CHIP	ECCH0000113	18 pF,50V,J,NP0,TC,1005,R/TP		
6	C324	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C325	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP		
6	C326	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C327	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C328	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP		
6	C355	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
6	C356	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C357	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C358	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C400	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C401	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C402	CAP,CHIP,MAKER	ECZH0001420	1 uF,10V ,K ,X5R ,HD ,1608 ,R/TP		
6	C403	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C404	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C405	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C407	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C408	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C409	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C410	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C411	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C412	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C413	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C414	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C416	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C417	CAP,TANTAL,CHIP,MAKER	ECTZ0005601	33 uF,6.3V ,M ,L_ESR ,ETC ,R/TP		
6	C418	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C419	CAP,CERAMIC,CHIP	ECCH0002002	47000 pF,10V ,K ,B ,HD ,1005 ,R/TP		
6	C420	CAP,CERAMIC,CHIP	ECCH0002002	47000 pF,10V ,K ,B ,HD ,1005 ,R/TP		
6	C421	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C465	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C477	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		

10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C489	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C500	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C501	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C502	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
6	C503	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C506	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C577	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C578	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C777	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C981	CAP,CHIP,MAKER	ECZH0001420	1 uF,10V ,K ,X5R ,HD ,1608 ,R/TP		
6	CN501	CONNECTOR,ETC	ENZY0014301	3 PIN,2.5 mm,ETC , ,Battery Connector		
6	CN502	CONNECTOR,I/O	ENRY0004501	24 PIN,0.5 mm,ETC , ,0.8 Offset type		
6	CN600	CONNECTOR, BOARD TO BOARD	ENBY0034601	34 PIN,0.4 mm,ETC , ,H=2.0, Socket		
6	CN601	CONNECTOR, BOARD TO BOARD	ENBY0020401	24 PIN,0.4 mm,ETC , ,H=0.9, Socket		
6	CN602	CONNECTOR, BOARD TO BOARD	ENBY0028801	50 PIN,.4 mm,ETC , ,H=1.5, P4S Header		
6	CON500	CONN,SOCKET	ENSY0001602	6 PIN,ETC ,5 IRECTIONAL ,2.54 mm,K(GC200)		
6	D400	DIODE,SWITCHING	EDSY0015501	EMD2 ,30 V,200 mA,R/TP ,VF=0.6V(IF=0.2A) / IR=1.0MICRO-A(VR=10V)		
6	D500	DIODE,TVS	EDTY0006201	SOD-323 ,12 V,350 W,R/TP ,Single Line TVS Diode for ESD		
6	D501	DIODE,TVS	EDTY0001901	SOD-323 ,6 V,350 W,R/TP ,Junction capacitance:350 pF		
6	D600	DIODE,SWITCHING	EDSY0015501	EMD2 ,30 V,200 mA,R/TP ,VF=0.6V(IF=0.2A) / IR=1.0MICRO-A(VR=10V)		
6	D700	DIODE,SWITCHING	EDSY0015501	EMD2 ,30 V,200 mA,R/TP ,VF=0.6V(IF=0.2A) / IR=1.0MICRO-A(VR=10V)		
6	D701	DIODE,SWITCHING	EDSY0015501	EMD2 ,30 V,200 mA,R/TP ,VF=0.6V(IF=0.2A) / IR=1.0MICRO-A(VR=10V)		
6	FB100	FILTER,BEAD,CHIP	SFBH0000903	600 ohm,1005 ,		
6	FB101	FILTER,BEAD,CHIP	SFBH0000903	600 ohm,1005 ,		
6	FB102	FILTER,BEAD,CHIP	SFBH0000903	600 ohm,1005 ,		
6	FB104	FILTER,BEAD,CHIP	SFBH0000903	600 ohm,1005 ,		
6	FB602	FILTER,BEAD,CHIP	SFBH0000909	60 ohm,1005 ,		
6	FL100	FILTER,SAW	SFSY0024701	881.5 MHz,2.0*1.4*0.68 ,SMD ,5pin, Unbal-Bal, 50/150, B9001 Low Loss ver.		
6	FL101	FILTER,SAW	SFSY0024801	1960 MHz,2.0*1.4*0.68 ,SMD ,5pin, Unbal-Bal, 50/150, B7825 Low Loss ver.		
6	FL102	FILTER,SAW	SFSY0021701	942.5 MHz,2.0*1.4*0.68 ,SMD ,5pin, Unbal-Bal, 50//150		
6	FL103	FILTER,SAW	SFSY0021801	1842.5 MHz,2.0*1.4*0.68 ,SMD ,5pin, Unbal-Bal, 50//150		

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	FL104	FILTER,EMI/POWER	SFEY0006501	SMD ,3 TERMINAL EMI FILTER		
6	FL105	FILTER,SAW	SFSY0020101	1880 MHz,2.0*1.6*0.8 ,SMD ,		
6	FL106	DUPLEXER,PCS	SDPY0002902	1880 MHz,1960 MHz,3.8 dB,3.5 dB,43 dB,52 dB,3.8*3.8*1.4 ,SMD ,FBAR		
6	FL107	DUPLEXER,DCN	SDDY0004101	836.5 MHz,881.5 MHz,2.0 dB,2.7 dB,49 dB,61 dB,3.0*2.5*1.25 ,SMD ,		
6	FL108	FILTER,SAW	SFSY0018101	836.5 MHz,2.0*1.6*0.68 ,SMD ,		
6	FL109	FILTER,SAW	SFSY0018201	881.5 MHz,2.0*1.4*0.78 ,SMD ,		
6	FL110	FILTER,SAW	SFSY0024901	1960 MHz,2.0*1.4*0.68 ,SMD ,5pin, Unbal-Bal, 50/100, B7834 Low Loss ver.		
6	FL500	FILTER,EMI/POWER	SFEY0006501	SMD ,3 TERMINAL EMI FILTER		
6	FL600	FILTER,EMI/POWER	SFEY0010401	SMD ,4ch, 18V, 15pF, 50ohm Pb-free		
6	FL601	FILTER,EMI/POWER	SFEY0010401	SMD ,4ch, 18V, 15pF, 50ohm Pb-free		
6	FL602	FILTER,EMI/POWER	SFEY0010401	SMD ,4ch, 18V, 15pF, 50ohm Pb-free		
6	FL603	FILTER,EMI/POWER	SFEY0010401	SMD ,4ch, 18V, 15pF, 50ohm Pb-free		
6	FL604	FILTER,EMI/POWER	SFEY0010401	SMD ,4ch, 18V, 15pF, 50ohm Pb-free		
6	FL605	FILTER,EMI/POWER	SFEY0009401	SMD ,100ohm,30pF(total capacitance), Pb-free		
6	FL606	FILTER,EMI/POWER	SFEY0009401	SMD ,100ohm,30pF(total capacitance), Pb-free		
6	FL607	FILTER,EMI/POWER	SFEY0009401	SMD ,100ohm,30pF(total capacitance), Pb-free		
6	L100	INDUCTOR,CHIP	ELCH0005020	1 nH,S ,1005 ,R/TP ,		
6	L1001	INDUCTOR,CHIP	ELCH0001408	6.8 nH,J ,1005 ,R/TP ,Pb Free		
6	L1002	INDUCTOR,CHIP	ELCH0001408	6.8 nH,J ,1005 ,R/TP ,Pb Free		
6	L101	INDUCTOR,CHIP	ELCH0001401	15 nH,J ,1005 ,R/TP ,Pb Free		
6	L102	INDUCTOR,CHIP	ELCH0005013	4.7 nH,S ,1005 ,R/TP ,		
6	L105	INDUCTOR,CHIP	ELCH0001022	56 nH,J ,1005 ,R/TP ,Pb Free		
6	L107	INDUCTOR,CHIP	ELCH0005020	1 nH,S ,1005 ,R/TP ,		
6	L108	INDUCTOR,CHIP	ELCH0005013	4.7 nH,S ,1005 ,R/TP ,		
6	L110	INDUCTOR,CHIP	ELCH0005802	2.2 nH,S ,1005 ,R/TP ,		
6	L111	INDUCTOR,CHIP	ELCH0005015	6.8 nH,S ,1005 ,R/TP ,		
6	L112	INDUCTOR,CHIP	ELCH0003813	47 nH,J ,1005 ,R/TP ,COIL TYPE		
6	L113	INDUCTOR,CHIP	ELCH0005807	5.6 nH,S ,1005 ,R/TP ,		
6	L114	INDUCTOR,CHIP	ELCH0005802	2.2 nH,S ,1005 ,R/TP ,		
6	L118	INDUCTOR,CHIP	ELCH0005013	4.7 nH,S ,1005 ,R/TP ,		
6	L119	INDUCTOR,CHIP	ELCH0005013	4.7 nH,S ,1005 ,R/TP ,		
6	L120	INDUCTOR,CHIP	ELCH0003813	47 nH,J ,1005 ,R/TP ,COIL TYPE		
6	L123	INDUCTOR,CHIP	ELCH0005015	6.8 nH,S ,1005 ,R/TP ,		
6	L124	INDUCTOR,CHIP	ELCH0005013	4.7 nH,S ,1005 ,R/TP ,		
6	L125	INDUCTOR,CHIP	ELCH0005013	4.7 nH,S ,1005 ,R/TP ,		

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	L126	INDUCTOR,CHIP	ELCH0005013	4.7 nH,S ,1005 ,R/TP ,		
6	L127	INDUCTOR,CHIP	ELCH0005013	4.7 nH,S ,1005 ,R/TP ,		
6	L128	INDUCTOR,CHIP	ELCH0005013	4.7 nH,S ,1005 ,R/TP ,		
6	L129	INDUCTOR,CHIP	ELCH0003813	47 nH,J ,1005 ,R/TP ,COIL TYPE		
6	L130	INDUCTOR,CHIP	ELCH0005020	1 nH,S ,1005 ,R/TP ,		
6	L137	INDUCTOR,CHIP	ELCH0001033	1.5 nH,S ,1005 ,R/TP ,PBFREE		
6	L141	INDUCTOR,CHIP	ELCH0005019	68 nH,J ,1005 ,R/TP ,		
6	L142	INDUCTOR,CHIP	ELCH0001409	10 nH,J ,1005 ,R/TP ,PBFREE		
6	L143	INDUCTOR,CHIP	ELCH0001408	6.8 nH,J ,1005 ,R/TP ,Pb Free		
6	L144	INDUCTOR,CHIP	ELCH0001004	8.2 nH,J ,1005 ,R/TP ,Pb Free		
6	L145	INDUCTOR,CHIP	ELCH0001407	5.6 nH,S ,1005 ,R/TP ,PBFREE		
6	L146	INDUCTOR,CHIP	ELCH0001004	8.2 nH,J ,1005 ,R/TP ,Pb Free		
6	L148	INDUCTOR,CHIP	ELCH0003813	47 nH,J ,1005 ,R/TP ,COIL TYPE		
6	L149	INDUCTOR,CHIP	ELCH0001406	4.7 nH,S ,1005 ,R/TP ,PBFREE		
6	L150	INDUCTOR,CHIP	ELCH0001405	3.3 nH,S ,1005 ,R/TP ,PBFREE		
6	L151	INDUCTOR,CHIP	ELCH0001405	3.3 nH,S ,1005 ,R/TP ,PBFREE		
6	L152	INDUCTOR,CHIP	ELCH0001401	15 nH,J ,1005 ,R/TP ,Pb Free		
6	L153	INDUCTOR,CHIP	ELCH0001404	1.5 nH,S,1005,R/TP		
6	L154	INDUCTOR,CHIP	ELCH0001004	8.2 nH,J ,1005 ,R/TP ,Pb Free		
6	L160	INDUCTOR,CHIP	ELCH0005802	2.2 nH,S ,1005 ,R/TP ,		
6	L172	INDUCTOR,CHIP	ELCH0005013	4.7 nH,S ,1005 ,R/TP ,		
6	L300	INDUCTOR,SMD,POWER	ELCP0008001	4.7 uH,M ,2.5*2.0*1.0 ,R/TP ,		
6	L301	INDUCTOR,SMD,POWER	ELCP0008001	4.7 uH,M ,2.5*2.0*1.0 ,R/TP ,		
6	L400	INDUCTOR,SMD,POWER	ELCP0008001	4.7 uH,M ,2.5*2.0*1.0 ,R/TP ,		
6	L401	INDUCTOR,CHIP	ELCH0001040	3.9 nH,S ,1005 ,R/TP ,PBFREE		
6	L402	INDUCTOR,CHIP	ELCH0005015	6.8 nH,S ,1005 ,R/TP ,		
6	M1	MODULE,ETC	SMZY0009501	Bluetooth RF Module, 5.0*4.0*1.1		
6	Q100	TR,BJT,ARRAY	EQBA0000602	TESV ,200 mW,R/TP ,EPITAXIAL PLANAR NPN/PNP TRANSISTOR		
6	Q101	TR,BJT,ARRAY	EQBA0000602	TESV ,200 mW,R/TP ,EPITAXIAL PLANAR NPN/PNP TRANSISTOR		
6	Q102	TR,BJT,ARRAY	EQBA0000602	TESV ,200 mW,R/TP ,EPITAXIAL PLANAR NPN/PNP TRANSISTOR		
6	Q400	TR,BJT,PNP	EQBP0009901	TSMT6 ,0.5 W,R/TP ,Vceo=-12V, Ic=-3A, hFE=270~680		
6	Q401	TR,FET,P-CHANNEL	EQFP0004701	TSOP6 ,1.5 W,20 V,-5 A,R/TP ,P-CHANNEL 20-V(D-S) MOSFET, Pb free		
6	Q444	TR,FET,N-CHANNEL	EQFN0006901	BGA (2*2, 0.8 PITCH) 4PIN ,1.47 W,20 V,5.3 A,R/TP ,Low ON-Rds=0.031ohm, N-ch MOSFET, Pb-free		
6	Q445	TR,FET,P-CHANNEL	EQFP0006801	MICRO FOOT ,1.47 W,-20 V,-5.8 A,R/TP ,		

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	Q500	TR,BJT,NPN	EQBN0003901	EM3,0.15W,R/TP		
6	Q501	TR,BJT,ARRAY	EQBA0000301	SC-88A,0.15W,R/TP,NPN/PNP DUAL		
6	R100	RES,CHIP,MAKER	ERHZ0000231	180 Kohm,1/16W ,F ,1005 ,R/TP		
6	R1000	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1001	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1002	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1003	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R1004	RES,CHIP	ERHY0003401	1800 ohm,1/16W ,J ,1005 ,R/TP		
6	R1005	RES,CHIP,MAKER	ERHZ0000465	3300 ohm,1/16W ,J ,1005 ,R/TP		
6	R1006	RES,CHIP	ERHY0011601	11 Kohm,1/16W ,F ,1005 ,R/TP		
6	R1008	RES,CHIP	ERHY0000186	2.2 Kohm,1/16W ,F ,1005 ,R/TP		
6	R1009	RES,CHIP,MAKER	ERHZ0000267	3300 ohm,1/16W ,F ,1005 ,R/TP		
6	R101	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1010	RES,CHIP,MAKER	ERHZ0000270	33 ohm,1/16W ,F ,1005 ,R/TP		
6	R1011	RES,CHIP,MAKER	ERHZ0000307	6200 ohm,1/16W ,F ,1005 ,R/TP		
6	R1012	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R1013	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1014	RES,CHIP,MAKER	ERHZ0000419	15 ohm,1/16W ,J ,1005 ,R/TP		
6	R1015	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R1016	RES,CHIP,MAKER	ERHZ0000419	15 ohm,1/16W ,J ,1005 ,R/TP		
6	R1017	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R1018	RES,CHIP,MAKER	ERHZ0000531	270 ohm,1/16W ,J ,1005 ,R/TP		
6	R1019	RES,CHIP,MAKER	ERHZ0000531	270 ohm,1/16W ,J ,1005 ,R/TP		
6	R102	RES,CHIP,MAKER	ERHZ0000288	470 Kohm,1/16W ,F ,1005 ,R/TP		
6	R1020	RES,CHIP	ERHY0003501	220 ohm,1/16W ,J ,1005 ,R/TP		
6	R1021	RES,CHIP	ERHY0003501	220 ohm,1/16W ,J ,1005 ,R/TP		
6	R1022	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R1023	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R1024	THERMISTOR	SETY0000903	NTC ,68000 ohm,SMD ,+/- 10% / 2012 SIZE, Pb Free		
6	R1025	RES,CHIP,MAKER	ERHZ0000318	80.6 Kohm,1/16W ,F ,1005 ,R/TP		
6	R1026	RES,CHIP,MAKER	ERHZ0000288	470 Kohm,1/16W ,F ,1005 ,R/TP		
6	R1027	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1028	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R1029	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R103	RES,CHIP,MAKER	ERHZ0000222	150 Kohm,1/16W ,F ,1005 ,R/TP		
6	R1030	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1031	RES,CHIP	ERHY0011601	11 Kohm,1/16W ,F ,1005 ,R/TP		

10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R1032	RES,CHIP,MAKER	ERHZ0000441	22 ohm,1/16W ,J ,1005 ,R/TP		
6	R1033	RES,CHIP,MAKER	ERHZ0000441	22 ohm,1/16W ,J ,1005 ,R/TP		
6	R1034	RES,CHIP	ERHY0005902	5.62 Kohm,1/16W ,F ,1005 ,R/TP		
6	R1035	RES,CHIP	ERHY0011601	11 Kohm,1/16W ,F ,1005 ,R/TP		
6	R1036	RES,CHIP,MAKER	ERHZ0000201	100 ohm,1/16W ,F ,1005 ,R/TP		
6	R1037	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R1038	RES,CHIP	ERHY0005902	5.62 Kohm,1/16W ,F ,1005 ,R/TP		
6	R1039	RES,CHIP	ERHY0005902	5.62 Kohm,1/16W ,F ,1005 ,R/TP		
6	R104	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R1040	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R1041	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R1042	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R1043	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R1046	RES,CHIP,MAKER	ERHZ0000530	5.1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R105	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R108	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R109	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R110	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R111	RES,CHIP,MAKER	ERHZ0000231	180 Kohm,1/16W ,F ,1005 ,R/TP		
6	R112	RES,CHIP,MAKER	ERHZ0000287	47 Kohm,1/16W ,F ,1005 ,R/TP		
6	R114	RES,CHIP,MAKER	ERHZ0000441	22 ohm,1/16W ,J ,1005 ,R/TP		
6	R117	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R118	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R119	RES,CHIP,MAKER	ERHZ0000437	2 Kohm,1/16W ,J ,1005 ,R/TP		
6	R122	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R123	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R124	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R170	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R190	RES,CHIP,MAKER	ERHZ0000204	100 Kohm,1/16W ,F ,1005 ,R/TP		
6	R1900	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R200	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R201	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R202	RES,CHIP	ERHY0003201	1000 ohm,1/16W ,F ,1005 ,R/TP		
6	R203	RES,CHIP,MAKER	ERHZ0000308	62 Kohm,1/16W ,F ,1005 ,R/TP		
6	R204	RES,CHIP,MAKER	ERHZ0000308	62 Kohm,1/16W ,F ,1005 ,R/TP		
6	R206	RES,CHIP	ERHY0003201	1000 ohm,1/16W ,F ,1005 ,R/TP		
6	R207	RES,CHIP,MAKER	ERHZ0000308	62 Kohm,1/16W ,F ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R208	RES,CHIP,MAKER	ERHZ0000308	62 Kohm,1/16W ,F ,1005 ,R/TP		
6	R213	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R221	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R233	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R300	RES,CHIP,MAKER	ERHZ0003901	.1 ohm,1/4W ,F ,2012 ,R/TP		
6	R301	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R302	RES,CHIP,MAKER	ERHZ0000439	200 Kohm,1/16W ,J ,1005 ,R/TP		
6	R303	RES,CHIP,MAKER	ERHZ0004201	121000 ohm,1/16W ,F ,1005 ,R/TP		
6	R304	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R305	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R306	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R307	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R310	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R311	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R312	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R313	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R314	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R316	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R355	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R356	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R400	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R401	RES,CHIP,MAKER	ERHZ0000422	15 Kohm,1/16W ,J ,1005 ,R/TP		
6	R402	RES,CHIP,MAKER	ERHZ0000500	62 ohm,1/16W ,J ,1005 ,R/TP		
6	R403	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R404	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R405	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R409	RES,CHIP	ERHY0000128	15K ohm,1/16W,F,1005,R/TP		
6	R410	RES,CHIP,MAKER	ERHZ0000288	470 Kohm,1/16W ,F ,1005 ,R/TP		
6	R411	RES,CHIP,MAKER	ERHZ0000537	680000 ohm,1/16W ,F ,1005 ,R/TP		
6	R412	RES,CHIP,MAKER	ERHZ0000537	680000 ohm,1/16W ,F ,1005 ,R/TP		
6	R455	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R470	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R478	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R480	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R499	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R500	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R501	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		

10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R504	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R555	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R556	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R577	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	R888	RES,CHIP,MAKER	ERHZ0000490	51 ohm,1/16W ,J ,1005 ,R/TP		
6	RA500	RES,ARRAY,R	ERNR0000403	10000 ohm, ohm,8 PIN,J ,1/32 W ,SMD ,R/TP		
6	SW100	CONN,RF SWITCH	ENWY0003301	,SMD ,0.4 dB,		
6	U100	FILTER,SEPERATOR	SFAY0005701	900 ,1800 ,0.95 dB,1.05 dB,30 dB,25 dB,4532 ,GSM Quad/UMTS Dual Mode ASM		
6	U101	IC	EUSY0203802	QFN ,56 PIN,R/TP ,GSM/WCDMA TRANSMITTER & GSM RECEIVER		
6	U102	PAM	SMPY0009901	33 dBm,50 %, A, dBc, dB,7*7*1.3 ,SMD ,GSM/EDGE PAM		
6	U104	COUPLER,RF DIRECTIONAL	SCDY0003201	-20 dB,-.28 dB,32 dB,1.6*0.8*0.6 ,SMD ,1800M ~ 1910M, 6pin, Pb Free		
6	U105	PAM	SMPY0010601	28 dBm,41 %, A,-51 dBc, dB,4X4 ,SMD ,QFN ,24 PIN,R/TP ,DUAL-BAND PAM(CELL/USPCS		
6	U106	COUPLER,RF DIRECTIONAL	SCDY0003202	-21.5 dB,-0.21 dB,-30 dB,1.6*0.8*0.6 ,SMD ,824M ~ 849M, 6pin, Pb Free		
6	U107	IC	EUSY0237901	8-microSMD(CSP) ,8 PIN,R/TP ,Dual Channel Power Detector		
6	U108	IC	EUSY0161002	BCCP ,40 PIN,R/TP ,WCDMA RF TO B/B RECEIVER IC		
6	U109	IC	EUSY0160902	BCCP ,16 PIN,R/TP ,WCDMA LNA IC		
6	U110	IC	EUSY0084701	SSOP5-P-A ,6 PIN,R/TP ,Inverter, Pb Free		
6	U200	IC	EUSY0241701	BALL CSP ,409 PIN,R/TP ,WCDMA/GSM/GPRS/EDGE/HSDPA MODEM		
6	U302	IC	EUSY0297301	11*14*1.2 ,225 PIN,R/TP ,NAND(90nm), DRAM(90nm)		
6	U303	MICROPHONE	SUMY0010601	UNIT ,42 dB,6.15*3.76*1.65 ,Bottom Silicon SMD		
6	U400	IC	EUSY0203701	BCC ,84 PIN,R/TP ,PMIC(MSMC 1.375V), Pb Free		
6	U500	IC	EUSY0184803	MLF ,6 PIN,R/TP ,150mA, 2.8V High PSRR uCap LDO Regulator,PBFREE		
6	U501	IC	EUSY0236901	DFN ,12 PIN,R/TP ,1x/1.5x/2x Charge pump(Sink type)		
6	U502	DIODE,TVS	EDTY0007801	SC-70 ,5 V,150 W,R/TP ,LOW CAPACITANCE TVS ARRAY		
6	U503	IC	EUSY0254901	MLF ,10 PIN,R/TP ,Dual(2.7V/150mA,1.8V/300mA) LDO		
6	U504	IC	EUSY0200301	Leadless chip ,6 PIN,R/TP ,Hall S/W, Pb Free		
6	U505	DIODE,TVS	EDTY0007801	SC-70 ,5 V,150 W,R/TP ,LOW CAPACITANCE TVS ARRAY		
6	U506	IC	EUSY0278601	QFN ,9 PIN,R/TP ,9 PIN,R/TP ,2.5W Mono D-Class Audio AMP		
6	U507	IC	EUSY0278601	QFN ,9 PIN,R/TP ,9 PIN,R/TP ,2.5W Mono D-Class Audio AMP		
6	VA501	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	VA502	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA503	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA504	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA505	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA506	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA507	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA508	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA509	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA510	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA511	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA512	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA513	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA516	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA517	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA518	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA519	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA525	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA526	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA527	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA554	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA555	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA600	VARISTOR	SEVY0003801	18 V, ,SMD ,		
6	VA601	VARISTOR	SEVY0003801	18 V, ,SMD ,		
6	VA602	VARISTOR	SEVY0003801	18 V, ,SMD ,		
6	VA603	VARISTOR	SEVY0003801	18 V, ,SMD ,		
6	VA604	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA605	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA666	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA777	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	X100	VCO	EXSC0009301	MHz, PPM, pF,SMD ,5.5*4.8*1.6 ,1368M~1528M, 1688M~1788M, 8pin, DBSO, Pb Free		
6	X101	VCO	EXSC0009201	MHz, PPM, pF,SMD ,5.5*4.8*1.5 ,824MHz ~ 915MHz, 1710MHz ~ 1910MHz, 14pin		
6	X102	VCTCXO	EXSK0005003	19.2 MHz,2 PPM,10 pF,SMD ,3.2*2.5*1.1 ,		
6	X200	X-TAL	EXXY0015501	48 MHz,50 PPM,12 pF,40 ohm,SMD ,3.2*2.5*0.7 ,		
6	X400	X-TAL	EXXY0016601	32.768 KHz,20 PPM,9 pF,65 Kohm,SMD ,4.9*1.8*0.9 ,		
6	ZD600	DIODE,TVS	EDTY0007501	SOD-523 ,5 V,240 W,R/TP ,Vc 12.5V , 160pF , 1.6*0.8*.06		

10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	SAFD00	PCB ASSY,MAIN,SMT TOP	SAFD0057501			
6	LD506	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	LD507	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	LD509	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	LD510	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	LD511	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	LD513	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	LD514	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	LD515	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	LD520	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	LD521	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	LD522	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	LD523	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	LD524	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	LD525	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	LD526	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	LD527	DIODE,LED,CHIP	EDLH0005901	White ,1608 ,R/TP ,White LED		
6	R1044	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R1045	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R451	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R452	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R456	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R457	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R458	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R459	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R465	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R466	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R467	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R468	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R469	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R471	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R472	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R495	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	VA500	VARISTOR	SEVY0000702	14 V,10% ,SMD ,		
6	VA515	VARISTOR	SEVY0000702	14 V,10% ,SMD ,		
6	VA520	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA521	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	VA522	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA523	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA524	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
5	SPFY00	PCB,MAIN	SPFY0112601	FR-4 ,0.8 mm,STAGGERED-8 ,		
5	WSYY00	SOFTWARE	WSYY0359301	cu500-msm-v10b-jun-22-2006-cw-us@ V08b		
3	SAJY00	PCB ASSY,SUB	SAJY0015801			88
4	MPBZ00	PAD	MPBZ0152001	COMPLEX, (empty), , , , ,		
4	SAJE00	PCB ASSY,SUB,SMT	SAJE0011401			
5	SAJC00	PCB ASSY,SUB,SMT BOTTOM	SAJC0006701			
6	BAT100	BATTERY,CELL,LITHIUM	SBCL0001305	3 V,1 mAh,COIN ,SMT Temp.260 degree. PB-Free B/B		
6	C100	CAP,TANTAL,CHIP,MAKER	ECTZ0003701	10 uF,6.3V ,M ,STD ,2012 ,R/TP		
6	C102	CAP,TANTAL,CHIP,MAKER	ECTZ0005601	33 uF,6.3V ,M ,L_ESR ,ETC ,R/TP		
6	C104	CAP,TANTAL,CHIP,MAKER	ECTZ0005601	33 uF,6.3V ,M ,L_ESR ,ETC ,R/TP		
6	C109	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C117	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	CON100	CONN,JACK/PLUG, EARPHONE	ENJE0003105	4 ,4 PIN,POP-UP		
6	R100	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R109	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R200	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R201	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	S100	CONN,SOCKET	ENSY0014101	8 PIN,ETC , ,1.1 mm,T-Flash Memory Socket		
6	U101	IC	EUSY0250501	SC70 ,5 PIN,R/TP ,Comparator, pin compatible to EUSY0077701		
6	U102	DIODE,TVS	EDTY0007801	SC-70 ,5 V,150 W,R/TP ,LOW CAPACITANCE TVS ARRAY		
5	SAJD00	PCB ASSY,SUB,SMT TOP	SAJD0007701			
6	C101	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C103	CAP,CHIP,MAKER	ECZH0004402	0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP		
6	C105	CAP,CERAMIC,CHIP	ECCH0000147	2.2 nF,50V,K,X7R,HD,1005,R/TP		
6	C106	CAP,CERAMIC,CHIP	ECCH0000147	2.2 nF,50V,K,X7R,HD,1005,R/TP		
6	C107	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C108	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C118	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	CN100	CONNECTOR, BOARD TO BOARD	ENBY0025801	34 PIN,0.4 mm,ETC , ,H=1.5, Header		
6	R101	RES,CHIP,MAKER	ERHZ0000477	390 Kohm,1/16W ,J ,1005 ,R/TP		
6	R102	RES,CHIP,MAKER	ERHZ0000407	1000 Kohm,1/16W ,J ,1005 ,R/TP		

10. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R103	RES,CHIP,MAKER	ERHZ0000467	330 Kohm,1/16W ,J ,1005 ,R/TP		
6	R104	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R105	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R106	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R107	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	U100	DIODE,TVS	EDTY0007601	SC-89 ,5 V,100 W,R/TP ,5 Channel Array , Vc 12V , 75pF , 1.6*1.625*0.58		
5	SPJY00	PCB,SUB	SPJY0020701	FR-4 ,.5 mm,MULTI-4 ,		

10.3 Accessory

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Specification	Color	Remark
3	SBPP00	BATTERY PACK, LI-POLYMER	SBPP0015001	3.7 V,1000 mAh,1 CELL,PRISMATIC ,CU500 CGR, BATT, Pb-Free		
3	SSAD00	ADAPTOR,AC-DC	SSAD0016903	100-240V ,5060 Hz,4.6 V,0.8 A,UL & CSA ,		

Note